



State of Washington
DEPARTMENT OF FISH AND WILDLIFE

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October 16, 2001

Dear Supplemental Environmental Impact Statement Recipient:

**RE: Request for Public Comments on Lake and Stream Rehabilitation Program:
Rotenone and Health Issues Draft Supplemental Environmental Impact Statement,
October, 2001.**

Enclosed is the SEPA Draft Supplemental Environmental Impact Statement (DSEIS) titled, Lake and Stream Rehabilitation Program: Rotenone and Health Issues. The Draft Non-Project Review Form (DNPR) was used as a basis for preparing this DSEIS. The DNPR is an experimental non-project form being reviewed by the Department of Ecology to be used as an analysis tool.

Lake and Stream Rehabilitation Program: Rotenone and Health Issues has been prepared to review any new information, since 1992, concerning health risks caused by the lake and stream program through the use of the chemical rotenone, conducted by the Washington Department of Fish and Wildlife's (WDFW) Fish Program. Health risks will be eliminated or reduced through new policies and protocol development.

This DSEIS is a supplement to the 1976 Proposed Lake and Stream Rehabilitation Program Environmental Impact Statement, and subsequent SEIS's annually through 1988 and again in 1992 (Lake and Stream Rehabilitation Program). The previous SEIS's reviewed the affected environment as it related to the natural environment (i.e., geology, air quality, plants and animals), and the built environment, as well as analyzed methods to carry out WDFW's lake and stream rehabilitation. Subsequent annual Addendums were issued through the year 2000 which identified which lakes or streams were to be treated with rotenone, the chemical chosen as a preferred method in the previous SEIS's. In addition, the Addendums identified pertinent treatment requirements of each body of water to be treated.

The objectives identified in this DSEIS include the following:

1. Review any new information on human health issues that may indicate a change of policy concerning how rotenone is used.
2. Provide policy and a framework for safe application of rotenone.
3. Provide a policy that will address health concerns, if any, of inert ingredients often used with rotenone.
4. Provide a policy and framework to protect both groundwater and the public if rotenone is used.

Both a No Action (Status Quo) Alternative and one Preferred Alternative has been chosen. After a literature search and review, the department found little to date, that indicated the rotenone was harmful to the general public in regard to the implementation of a lake or stream's rehabilitation to eliminate or reduce populations of introduced fish. However, applicators have been identified as at risk if the Environmental Protection Agency's (EPA's) procedures are not followed. Additional procedures have been added, in addition to those required by law, to reduce the risk of staff during application.

The DSEIS is located at the Washington Department of Fish and Wildlife's Olympia Office (600 Capitol Way North, Olympia, Washington 98501-1091) or at the department's Regional Offices. It also may be reviewed at the following internet site along with the Scoping Notice and Determination of Significance sent out on June 15, 2001:

<http://www.wa.gov/wdfw/hab/sepa/sepa.htm>

Comments are Due on **November 6, 2001**. Please send your comments to the following address:

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Responsible Official: Peter Birch

Position/Title: Environmental Services Division Manager

Address: 600 Capitol Way North, Olympia, WA 98501

DATE OF ISSUE: October 16, 2001 **SIGNATURE:**  for Peter Birch



*Washington
Department of*
**FISH and
WILDLIFE**

**Draft Supplemental Environmental Impact Statement
LAKE AND STREAM REHABILITATION: ROTENONE USE AND HEALTH RISKS**

Prepared by:

John S. Hisata
Fish Program
Fish Management Division

Date:
October 16, 2001

FACT SHEET

Draft Supplemental Environmental Impact Statement LAKE AND STREAM REHABILITATION: ROTENONE USE AND HEALTH RISKS

<p>The draft Non-Project Review Form developed by the Department of Ecology was used to prepare this SEIS</p>

Description:

Update to the 1992 Supplemental Environmental Impact Statement (SEIS) Lake and Stream Rehabilitation incorporating new information as required by WAC 197-11-405(4). Since the 1992 SEIS additional information has been presented concerning rotenone use and human health issues. The objectives of this supplement are to:

1. Review any new information on human health issues that may indicate a change of policy concerning how rotenone is used.
2. Provide policy and framework for safe application of rotenone.
3. Provide a policy that will address health concerns of inert ingredients often used with rotenone.
4. Provide a policy and framework to protect both groundwater and the public when rotenone is used.

This is a Supplemental EIS to the 1976 Final EIS, Proposed Lake and Stream Rehabilitation and Final SEIS's 1978/79 through 1992 and subsequent Addendums which identify lake and stream treatments. All copies can be obtained through the Washington State Library.

Proponent:

Washington Department of Fish and Wildlife

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Designated responsible official:

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Licenses Required:

National Pollution Discharge Elimination System Permit - Washington Department of Ecology (DOE)

Short-term Water Quality Modification - DOE

Authors and Principle Contributors:

This Document was prepared by John Hisata, Fish Management Division, Fish Program
Washington Department of Fish and Wildlife.

Date of Issue:

October 16, 2001

Date comments are due:

November 6, 2001

Locations where the Draft SEIS may be reviewed:

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Date final action is planned:

Fall 2002

Location of EIS Background Information:

SEPA Coordinator

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The cost to the public:

None

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Draft Supplemental Environmental Impact Statement

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SUMMARY

This supplement to the 1992 Supplemental Environmental Impact Statement, Lake and Stream Rehabilitation using rotenone is being undertaken to review published information new since 1992 on rotenone and its human health risks related to its use in fisheries management.

The following will be discussed: risk of rotenone use on human health; review of safety procedures for applicators; review of an alternative application method that reduces airborne dust and applicator exposure to rotenone, and incorporation of procedural changes to meet the need to address National Pollution Discharge Elimination System permit requirements.

Rotenone Label

Label requirements have changed since 1992, becoming more restrictive in general. Rotenone was under re-registration review by the EPA at the time the 1992 FSEIS was being developed. Rotenone was available for fishery management use in Washington at that time under a Special Local Need allowance granted by EPA. Re-registration approval for fishery management use was granted in 1993.

Human Health Effects

New information about rotenone and possible human health effects are reviewed. A report in 2000 indicated a possible connection between rotenone and Parkinson's disease.

Inert Ingredients

New information that has been reported on rotenone treatments and inert ingredients found in the liquid rotenone formulation has been reviewed.

Ground Water Effects

New information reported on rotenone treatment impacts to groundwater has been reviewed.

Potassium Permanganate

When necessary, potassium permanganate (KMnO_4) is used to quickly detoxify rotenone treated water. During the scoping process, the Washington Department of Ecology requested a review of the environmental and human health effects of potassium permanganate. This review is being undertaken since KMnO_4 will be used in conjunction with rotenone under some circumstances.

Public Information and Education

In an effort to improve public outreach, public meetings were incorporated, although not required in the scoping process for the development of this draft supplement.

Proposed Action

The proposed action is to modify the Washington Department of Fish and Wildlife's lake rehabilitation rotenone application procedures to improve applicator and public safety. The changes required to improve safety will be the following preferred alternative:

The supervisor of the application project will be charged with insuring that all label requirements are followed and all safety requirements are met. The application procedure for powdered rotenone product will be changed to a method pioneered by the Utah Division of Wildlife Resources, see below.

Additionally, Powered Air Purifying Respirators (PAPR) will be adopted for use by the applicator crews and support staff, see below.

Procedures will also be adopted as they are developed by the Department of Ecology in the department's pre-treatment process to meet the now required National Pollution Discharge Elimination System (NPDES) permit requirements. NPDES permits are now required for all pesticide applications that are to or will affect waters.

The alternative is no action or status quo. No changes to application methods or safety equipment would be made.

Justification

The Utah application method uses a pump and aspirator to vacuum rotenone powder from standard packaging, mixes it with lake water and applies the mixture back into the lake. Rotenone is now shipped in 50 kilogram quantities packaged in sealed, heavy gauge, removable plastic liners inside hermetically sealed pressed fiber drums, which meet Department of Transportation safe packaging requirements. This is the current standard packaging for the powdered rotenone products (Ruth Fisher, Prentiss Inc., personal communication).

Charles Thompson, Utah Division of Wildlife Resources (personal communication) reports that the PAPR are more comfortable to use than negative pressure respirators during the moderate to heavy physical activity required during rotenone application. The positive pressure air flow provided by the PAPR has no breathing resistance and provides respiratory protection without the need for a tight face seal, thus the fit testing step is not required (3M product description). Since PAPR will be easier to use under the typical conditions found during rotenone application, applicators and support staff use will improve over the negative pressure respirators which are the minimum required.

Detailed review of new information related to rotenone and its use in fisheries management showed that the Parkinson's disease connection with rotenone although demonstrated was not a practical concern when rotenone is applied as used in fisheries management. Additionally, the inert ingredients associated with the liquid rotenone formulation did not show in the treated waters at levels to be of concern when rotenone was applied according to label requirements by certified applicators. Ground water effects were minimal to non-existent due to the short active life of rotenone and its tendency to bind with organic matter. The chemical that acts as a synergist in a formulation of liquid rotenone has been a problem in that it persisted longer than rotenone, however this type of formulation has not been used by this agency since the 1970's because of inconsistent results. Wells tested adjacent to treated lakes and reservoirs showed no measurable traces of rotenone or associated inert ingredients.

INTRODUCTION

The 1976 Proposed Lake and Stream Rehabilitation EIS analyzed the need for lake and stream rehabilitation. Subsequent Supplemental EIS's and the 1992 SEIS, analyzed methods for fish control. These environmental impact assessments also investigated potential impacts of lake and stream rehabilitation to the environment. Rotenone was chosen as the preferred alternative.

As stated in the 1976 and subsequent EIS's through 1988 on lake and stream rehabilitation, the Washington Department of Fish and Wildlife (WDFW) manages lowland lakes throughout the state according to public desires, recreational demands, habitat considerations and previous management efforts. Angler surveys (Mongillo and Hahn 1986, 1996) have shown that trout are the most popular of the state's game fish, in addition, some lakes are managed to improve populations of warm water species such as bass, blue gill or crappie, the second most popular category of game fish reported by Mongillo and Hahn (1986, 1996). In response to these angler preferences, WDFW eliminates problem and competitor species in a portion of the state's lakes where possible using rotenone. This allows management for optimal populations of trout and selected warm water species that meet the state's angler's preferences. The overall objective of the program is to meet the department's mandate by addressing public demand and improving public recreational game fish fishing opportunities.

In the scoping process, a request to review in detail the effects from the use of an alternative piscicide, antimycin, one of the two approved piscicides, was received from the Washington Department of Ecology. However due to staff time constraints and since the scope of this review is focused on human health issues relative to rotenone, a review of antimycin was not undertaken.

The higher cost for the amount of antimycin needed in comparison to rotenone products needed to treat the alkaline waters found in eastern Washington, where the majority of treatments now take place, has limited consideration of its use. The product label for antimycin recommends application rates based on the alkalinity of the water to be treated and the target fish species. A cost comparison conducted by WDFW staff based on the label recommended treatment concentrations showed that a typical small lake (Goldeneye, 15 acres) in Grant County would cost 60% more (\$6,055 vs \$3,804) for the amount of antimycin required as the amount of rotenone required, based on treatment concentrations recommended by its product labels, to achieve the same results. The cost comparisons ranged from this to ten times as much just for the fish toxicant (e. g. West Medical Lake, Spokane County, \$897,575 vs \$88,074). West Medical Lake is infested with goldfish, a difficult species to control. If and when the use of antimycin becomes a stronger probability, a detailed review will be undertaken.

PROPOSED ACTION

There are two alternatives:

No action or status quo.

We would keep the same minimum safety measures as required by the USEPA on the MSDS. Since there are no indications of risk to human health when rotenone is applied according to label requirements based on current research, the following current procedures will remain in effect:

1. Pre-treatment procedures including public involvement and annual notification of waters to be treated will continue.
2. All approved application sites will be posted prior to treatment and patrolled by Fish and Wildlife Enforcement Officers during treatment.
3. Application timing will remain fall and early spring.

Preferred Alternative:

The greatest risk lies with the applicators and support staff that handle rotenone formulations before it is dispersed. The MSDS for both powdered and liquid rotenone formulations indicates that inhalation can be fatal. This requires that dust and spray mist be controlled as much as possible during application and that applicators and support staff be protected from inhalation risk. In addition to the procedures listed above, the following are proposed to reduce applicator and support staff risk:

1. Application sites will be monitored as prescribed in the department safety procedures for rotenone application adopted in 2001(Appendix C).
2. New application equipment will be placed into use that reduce the incidence of airborne dust. The Utah method of application employing pumps and aspirators will replace the current application method of towing sacks of rotenone. This method, along with standard rotenone packaging in drums will be adopted.
3. Powered Air Purifying Respirators will replace the negative pressure respirators now in use by applicators and support staff. This equipment will ease the discomfort experienced with the negative pressure respirators during the moderate to heavy physical activity involved with rotenone applications. This should minimize the tendency to remove respirators during heavy physical exertion.

DESCRIPTION OF PROCEDURES

Pre-Treatment Procedures

A lake or stream is selected for rotenone treatment when a viable trout fishery can only be provided with plants of catchable sized fish. These determinations are made by the WDFW Area Fish Biologist directly charged with managing the lake's gamefish. Standard indicators of fishery performance are the average catch per hour on opening day, fish size or growth and abundance from annual pre-season gillnet sets. When poor performance is coupled with gillnet and/or electroshocking data showing an increase in species outside the management emphasis, the Area Fish Biologist may recommend treatment of the water to his supervisor, the Regional Fisheries Program Manager.

A pre-rehabilitation plan (see Appendix B) containing vital information on the proposed treatment must be completed by the Area Fish Biologist.

In calculating the dosage of rotenone needed, the biologist considers a variety of physical and biological factors, the most important being target species, water chemistry, past success or failure in the lake and presence or absence of weedy areas or shoreline.

Dosage is calculated based on powder or liquid containing 5% rotenone, and is expressed as parts of powder or liquid formulation - not pure rotenone itself - per million parts of lake water (ppm) on a weight basis. One ppm is equivalent to one milligram per liter (1 mg/L).

The powdered rotenone used by WDFW rarely contains only 5% rotenone. WDFW receives most of its powder from South American sources through U. S. suppliers. Shipments are chemically assayed by batch by the U. S. supplier for active rotenone content. Powdered rotenone used in recent years has assayed between 7% and 8% active rotenone. Liquid preparations consistently contain 5% active rotenone. When these shipments are received and the exact assay known, biologists adjust the amount of powder to be used to conform to the concentration initial calculated based on 5% active rotenone.

The actual amount of rotenone needed is based on the estimated weight of water in the lake. This is determined by volumetric calculations using WDFW surveys on the particular lake.

The Regional Fisheries Program Manager presents his list of proposed treatments along with justification and evidence of review by the Regional Habitat Program Manager, the Regional Wildlife Program Manager and the Regional Director to the Fisheries Management Division headquarters of WDFW. Approval at this stage may depend not only on the validity of the biological justification, but to other considerations such as the lake's public use and its importance as a recreational fishery, and finally the availability of rotenone itself. Statewide priorities are established, and a list of candidate lakes drawn up.

After developing a list of candidate lakes, the public is notified through general news release, usually in early summer both statewide and in the vicinity of the water proposed to be treated. Area Fish Biologists also solicit public opinion from lakeshore residents and other groups in the

area. Public meetings are held in the vicinity of the waters proposed for treatment prior to a final decision. The list of candidate lakes is issued for public review in the counties where the lakes are located as an addendum to the 1992 FSEIS to meet SEPA requirements.

The final decision is made by the agency Director. Even with Director approval there is still a chance that a lake may not be treated if all pre-treatment steps such as water control measures (diking, damming) have not been completed.

Safety Procedures

Applicators (WDFW employees and volunteers) are required to use rotenone products in accordance with the product label. The use of formulated rotenone products must be supervised on-site by at least one person who has a Washington State certification as a pesticides applicator. The project supervisor must have the authority to start and stop the rotenone application and be well versed in the state regulatory requirements regarding safe and legal use of the rotenone product and applicator safety. All personnel (employees and volunteers) involved with the rotenone application must receive safety training specific to the formulated rotenone product that will be used. The guidelines for the Hazard Communications Program set forth in the department's Safety Program Manual must be followed.

At a minimum, specific safety training must include information on the following: (1) how to read and understand the product label; (2) the acute and chronic applicator exposure hazards; (3) routes and symptoms of pesticide overexposure; (4) how to obtain emergency medical care; (5) decontamination procedures; (6) how to use the required safety equipment; (7) safety requirements and proper procedures for pesticide handling, transportation, storage and disposal. The Training Records must be maintained in accordance with federal and state regulatory requirements.

Personal Protective Equipment (PPE) is required by the product label and material safety data sheet when using formulated rotenone pesticide products. The following PPE requirements for rotenone pesticide products are to be followed:

For rotenone powder application - To reduce respiratory exposure to rotenone powder, employees must wear a NIOSH approved N95 filtering face piece or half face negative pressure air purifying respirator with p100 hepa filter cartridges. Safety goggles, chemical resistant gloves (nitrile) and tyvek overalls must be worn to avoid dangerous dermal exposure.

For liquid rotenone formulation application - To reduce respiratory exposure to the liquid rotenone formulation, employees must wear a NIOSH approved half or full face negative pressure air purifying respirator using organic vapor cartridges approved for pesticides combined with a P100 hepa cartridge. Respirator cartridges are to be changed at the end of each work day. Safety splash goggles, nitrile chemical gloves and tyvek coveralls must be worn to reduce dermal exposure to the liquid rotenone formulation.

Employees who are assigned to use respirator equipment must be included in the department's

respiratory protection program. This program requires all respirator users to complete a confidential medical questionnaire to be reviewed by a contracted medical professional. Once the medical contractor advises the department on the employees capability to use respirator equipment, the employee must then complete respirator use training and fit testing. The fit testing and training must be repeated annually and records maintained.

The lake rehabilitation project must always include an employee with first aid and CPR training. First aid supplies, an emergency eye wash shower and emergency plan procedures must also be present.

Treatment Procedure

Fishing regulations are liberalized when possible to allow utilization of the fish in the waters scheduled for treatment. When needed, warmwater game fish, usually mature bass are collected prior to rehabilitation, to be utilized as broodstock for waters nearby which are managed for warmwater species fisheries. Bass that have floated to the surface have been netted by WDFW employees and bass club volunteers, revived by dipping the fish in a potassium permanganate solution, and moved to warmwater lakes to augment or start a population (Fletcher, 1976). The use of potassium permanganate also requires a short-term water quality modification (permit) issued by the Washington Department of Ecology.

Shortly before treatment, the lake is divided into sections of similar volume, and these sections are marked using buoys and shoreline markers.

On the day slated for treatment, each section of the lake is assigned to a WDFW employee. Application takes place by towing commercial rotenone powder specially packaged in burlap sacks behind a boat. The outboard prop wash helps to diffuse the rotenone. Additionally, the lakes are patrolled by Fish and Wildlife Enforcement Officers to prevent the public from picking up dead fish or swimming in the lake during the rotenone application.

Shorelines are sprayed with liquid rotenone by motorized pump and marshy area, and depending on size are sprayed by aerial application of powder or liquid formulation by pumps. The most common dosages of rotenone used in the lakes treated in Washington range between 1 and 4 ppm of 5% rotenone product.

Post-Treatment Procedures

In lakes with stream outlets, runoff from the lake must be controlled or detoxified. In some cases, the runoff is small enough that it can be dammed off (using sandbags, for example) until the rotenone is naturally degraded. When this is not possible, an oxidizing agent - usually potassium permanganate - is dripped into the outlet stream to detoxify the rotenone before it can harm fish and invertebrates very far down stream. Since 1992, such detoxification has been necessary in 3.6% of the lakes treated. Finlayson et al. (2000) and Archer (2001) provide detailed guidelines for detoxification with potassium permanganate.

In the lake itself, rotenone degrades naturally in a few days to eight weeks at the most. At intervals following treatment, WDFW Area Fish Biologists usually perform a series of simple

bioassays to determine how long the lake remains toxic to fish: hatchery rainbow trout are commonly suspended in the water column in cages and when these fish survive 1-6 days in the lake, it is considered nontoxic.

The biologist submits a Post-Rehabilitation Report (see Appendix B) for each water treated; it describes, among other things, the possibility of a complete kill, water conditions at the time of treatment, and detoxification measures if any.

Fish are restocked the following spring. During the post-treatment years, the Area Biologist continues to monitor fish survival, and growth, as well as catch rates for the water.

Number of Waters Treated

The first rotenone treatment in Washington State took place in September 1940 on Kings Lake (Pend Oreille County). Since that time 508 state waters have been treated at least once. The chlorinated hydrocarbon insecticide toxaphene was occasionally used instead of rotenone. Its use was discontinued in the late 1960's because of problems experienced with persistence of residues that killed planted trout fry (WDFW historic data). Since then, rotenone has been the only piscicide applied by the agency.

Almost all treatments have occurred in lakes and ponds, with only occasional stream or slough treatments. Waters treated since 1940 represent 6.1% of the total surface acreage of all lakes below 2,500 feet elevation in the state.

Since 1992, rotenone treatments have taken place in eight Washington Counties all in eastern Washington (Adams, Ferry, Grant, Lincoln, Okanogan, Pend Oreille, Spokane, and Stevens). One western Washington water was treated in 1998 (Crocker Lake, Jefferson County) to eliminate illegally introduced non-native northern pike as a measure to protect Endangered Species Act listed juvenile salmon from unnatural predation. One hundred eleven waters have been treated, five twice since 1992. Most (71.6%) of these eastern Washington waters were located on public lands (primarily WDFW controlled lands). The average size of the waters treated is 59.8 surface acres. On average 13 waters were treated each year with an average 79,500 pounds of powder and 440 gallons of liquid formulation rotenone.

Frequency of Rotenone Treatments

Rotenone treatments do not always kill all the fish in a lake. Problem species that survive repopulate the lake over time. In addition, problem species are often reintroduced illegally by anglers or lakeside residents. The appearance of species different from the ones that originally degraded the target fishery is evidence of this (WDFW historical record). The net result of any of these cases is the same: fish production and quality will eventually decline, and the lake may have to be rehabilitated again.

Of the 508 Washington lakes that have been treated, 283 (55.7%) have been treated more than once. The average length of time between treatments has been 7.74 years ($n = 522$ intervals, $s = 4.49$ years)

Target Species

In the eastern half of the state pumpkinseed sunfish was the most frequently targeted species for elimination, in the western half of the state, yellow perch was most frequently targeted. Other important target species statewide include carp, crappie, brown bullhead (catfish), largemouth bass, goldfish and northern pike. All are introduced, non-native species and all are problem species due to their ability to reproduce in great numbers, resulting in stunted populations and degraded fisheries.

A particular lake may experience recurring problems with the same target species over the course of many years. Often, however, the target species in frequently-rotenoned lakes changes over the years. This is often the case in “urban” lakes which are frequent targets for illegal fish introductions. Curt Kraemer (1989) found that of 27 lake records reviewed in Snohomish and north King County, 16 (59%) lake records showed illegal introductions during the 1980's. Species illegally introduced included largemouth bass, smallmouth bass, yellow perch, black crappie, pumpkin seed sunfish, blue gills, channel catfish, carp and fathead minnow.

The problem with illegal fish introductions continues to exist. For example, Leader Lake in Okanogan County which is managed as a rainbow trout fishery was rehabilitated in 1998 to remove smallmouth bass. The previous rehabilitation in 1974 was for carp. Marshall Lake in Pend Oreille County which is managed as a cutthroat trout fishery was rehabilitated in 1999 to remove yellow perch and largemouth bass. The previous rehabilitation for Marshall was the first in 1953 where reidside shiner, tench, introduced kokanee and long nose sucker were removed to allow management emphasis to begin for the cutthroat trout fishery.

Timing of Rotenone Treatments

Since 1992, 64.7% of rotenone treatments have taken place in the fall, mostly September and October. Only 34.5% have been spring treatments, and these occurred in March or early April. One treatment has taken place in the summer (July), Crocker Lake in Jefferson County.

Rotenone is applied in the fall because water levels are low; aquatic vegetation has declined; recreational use of the lake is reduced and most lake's summer thermal stratification has ended (allowing rotenone to circulate throughout the water column more quickly). Spring rotenone treatments are performed on lakes with extensive shallow or weedy areas. The higher water levels in the spring and reduced weed growth make these areas more accessible by boat for more efficient treatment. Also, in lakes where levels are affected by irrigation water storage or use, the low water time period will be in the late winter/early spring.

Legal Standing

The Washington Department of Fish and Wildlife and the Fish and Wildlife Commission are mandated through RCW 77.04.012 to enhance and improve recreational fishing in this state. The commission is mandated to maximize the public recreational game fishing opportunities of all citizens.

RCW 77.12.420 empowers the Fish and Wildlife Commission to eradicate “undesirable” types of

fish. The commission's right to rehabilitate lakes and streams was affirmed by Thurston-Mason County Superior Court in the case of Patrick vs. Biggs (#27476), January, 1954.

Funding

Lake and Stream Rehabilitation operations are funded through fishing license fees and at times has been funded through taxes collected by the federal government on fishing tackle at the manufacturing level and apportioned to the states under the Dingell-Johnson/Wallop-Breaux (DJ/WB) Act. When DJ/WB funds are used, funds used are limited to 75% of total project costs. A 25% contribution of Department of Fish and Wildlife monies is required by federal law. Lake and stream rehabilitation with rotenone is an approved fishery management activity under DJ/WB funding and is covered by a Programmatic Environmental Assessment conducted by the U.S. Fish and Wildlife Service under NEPA.

DETAILED ASSESSMENT OF IMPACTS

Rotenone Label

Current rotenone label use restrictions are:

- C For use by Certified Applicators or persons under their direct supervision and only for those uses covered by Certified Applicator certification.
- C To be used in fisheries management for the eradication of fish from lakes, ponds, reservoirs and streams.
- C Use this product only at locations and rates, and times authorized and approved by appropriate state and Federal fish and wildlife agencies.
- C Rotenone products may be applied at up to 5 parts per million of 5% active ingredient rotenone product as a maximum application rate. This application rate amounts to 0.25 parts per million of active rotenone.
- C Properly dispose of dead fish and unused product. Do not use dead fish as food or feed.
- C Water treated with rotenone may not be used to irrigate crops or be released within ½ mile upstream of a potable water or irrigation water intake in a standing body of water such as a lake, pond or reservoir.
- C Do not allow swimming in rotenone treated water until application has been completed and all pesticide has been thoroughly mixed into the water according to label restrictions.

Certified Applicator

To be in compliance with label restrictions, the Washington Department of Fish and Wildlife requires a Washington Department of Agriculture certified pesticide applicators to be present and supervise all rotenone applications. This individual has the authority to shut down the application process if necessary and is also charged with the responsibility of ensuring safe storage and distribution of rotenone and the safe disposal of all unused rotenone and discarded packaging. This individual is also responsible for ensuring that all safety measures are followed by applicator personnel and that safety equipment is present and usable.

Rotenone Use

Rotenone has been used by this agency for the eradication of undesirable fish from lakes, ponds, reservoirs and streams. The majority of rotenone applications have been in standing waters or streams connecting waters being treated. Use in streams has been limited because resident trout management emphasis for the most part has been directed toward standing waters. Six streams have been treated with rotenone for the benefit of resident trout management, all in eastern Washington. The last stream treated was an unnamed tributary to the Winchester Wasteway in Grant County in 1992. The objective of this treatment was to remove carp.

Application Rate

Application rates used by WDFW have been up to 5 parts per million (ppm) 5% rotenone product in very small (1.4 acres) waters where rapid dilution by water inflow was a factor. This amounts to a maximum application rate of 0.25 ppm active rotenone in the water at the time of application. Depending on the susceptibility of the target species in the waters selected for treatment and due to the expense of the higher application rates, ninety five percent of treatments are at 4 parts per million or less with most at application rates of 1 ppm to 2 ppm of 5% rotenone product. These application rates are effective on most target species. These application rates results in 0.050 ppm and 0.100 ppm active rotenone respectively in the treated water.

Dead Fish

To prevent the pick up and use as food or feed of freshly killed fish by the public, access to waters being treated is posted as closed and patrolled. Additionally, waters to be treated are closed to fishing immediately prior to treatment and for several months after treatment. For the most part, the lakes that are treated are under a seasonal restriction and the fishing season on the treated waters do not open again until the following spring. By treating waters in the fall and late winter, when water temperatures are low and weather cool, dead fish accumulations on the water surface and shoreline are minimized. Most sink to the bottom. Dead fish left to decompose in the treated water provide a nutrient base to stimulate phytoplankton and thus zooplankton production which will be the food base for replanted fish. Leaving the dead fish in the treated water is preferred for this reason. On occasion, clean up and disposal of dead fish accumulations on shorelines takes place to eliminate the nuisance factor. Removed dead fish are to be disposed of in approved landfills.

Crop Irrigation/Potable Water

The crop irrigation restriction is generally not a problem since treatment dates are selected to be after irrigation use has ceased in the fall and before irrigation resumes in the spring. No rotenone

treatments take place on waters where potable water withdrawal occurs. Treatments could take place in waters with potable water withdrawals if an alternate water supply is provided during the period that rotenone residues are present (up to about 8 weeks). However, the added cost of providing this alternative has prevented its use or consideration.

Swimming

Treatments are timed to occur in the fall, in October or in the late winter/early spring, in March when swimming does not normally occur. Waters being treated are closed to public access by posting and patrolled by Fish and Wildlife Enforcement Officers to insure that swimming does not take place during the rotenone application.

Human Health Effects

Millions of dollars have been spent by the U.S. Fish and Wildlife Service on research to determine the safety of rotenone in the re-registration approval process (Finlayson et al. 2000). This research demonstrated the environmental and human safety of the use of rotenone as a piscicide in fisheries resource management. Labels and fishery uses of rotenone have been successfully defended. The data developed confirm that rotenone is a safe product when applied by certified applicators according to label instructions.

There is one reported case of fatal rotenone poisoning, that of a child from Belgium (De Wilde et al., 1986). The authors indicated that they believed this to be the first reported case of fatal rotenone poisoning in man. The 3 ½ year old child had apparently swallowed a mouthful of an insecticide product called “Galicide”. Galicide is an insecticide manufactured in France of plant materials only and approved for external use on animals. The plant materials reported by the manufacturer in this insecticide are the ethereal oils of cinnamon, 18.5 g.; cloves, 27.5 g.; fir, 17.5 g. ; rosemary, 1.0 g. and thyme 1.0 g. making up a total of 65.5% of the solution. The remainder was 6.1 grams pure rotenone and 28.4 grams of emulsifier per 100 grams total of solution. Autopsy of the child found rotenone at ranges of 2 to 4 ppm in blood, liver, and kidney, but not able to be detected in the brain, muscle, and thymus. The authors report that although values of 2 to 4 ppm seem rather low, that it was very likely that these amounts caused the death of the victim; she died from respiratory arrest, a probable cause of death in severe rotenone poisoning. The authors further state that the presence of the ethereal plant oils in the Galicide solution might first have contributed to acute irreversible renal damage, dropping the clearance of rotenone from the blood to zero. This increased serum levels, and secondly these oils promoted the absorption of the water insoluble rotenone out of the gastro-intestinal tract, again increasing serum levels and thus enhancing toxicity.

Parkinson's Disease

Parkinson's disease results in a lost function of the brain cells that produce dopamine, used to transmit signals in the brain. Symptoms of the disease usually include limb tremors and occasional rigidity. The causes of Parkinson's disease are diverse and complex. Some cases can be attributed to genetic factors, and several mutations have lead to familial Parkinson's disease (Giasson and Lee 2000).

An Emory University study (Betarbet et al., 2000) reported finding a relationship between Parkinson's disease and rotenone. The Emory University study demonstrated that rotenone produced Parkinson's-like anatomical, neurochemical, and behavioral symptoms in laboratory rats when administered chronically and intravenously. In this study, 25 rats were continuously exposed for 5 weeks to 2 to 3 mg rotenone (dissolved in dimethyl sulfoxide [DMSO] and polyethylene glycol [PEG]) per kg body weight per day. The exposure was accomplished by injecting the mixture directly into the right jugular vein of the rats using an osmotic pump. Twelve of the 25 rats developed lesions characteristic of Parkinson's disease. Structures similar to Lewy bodies (microscopic protein deposits) in the neurons of the substantia nigra in the brain (characteristic of Parkinson's disease) were produced in several of the rotenone-exposed rats. Dr. J. T. Greenamyre who directed this study has been quoted as stating: "We have shown that exposure is sufficient to do it in rats and presumably the same can happen in people" (Adam, 2000). Dr. Joseph Borzelleca of the Virginia Commonwealth University Department of Pharmacology and Toxicology critically reviewed the Emory University study to determine its relevance for humans. Dr. Borzelleca writes in response to Dr. Greenamyre's quoted comment: "Marking (1988) administered rotenone in the diet to male and female rats (320) for 24 months (lifetime for rats) at doses up to 75-mg/kg-body weight/day. At the end of the study, all surviving rats were sacrificed and autopsied and all tissues and organs were examined grossly and microscopically. Several dozen tissue sections per animal were examined including all areas of the brain. There were no changes to the brains of the rats that had eaten rotenone daily for two years. This (Marking's) study is relevant for human exposure because entry into the body was with food (simulates the human condition). The doses in this study were about 30 times greater (2.5 versus 75 mg/kg-body weight/day) and the exposure was much longer (5 versus 104 weeks) than in the Greenamyre study. It is also important to note that the rats did not develop any signs of Parkinson's disease during the course of the study" (Borzelleca, letter, 2001). Dr. Borzelleca is an extensively published Pharmacologist/Toxicologist; researcher; journal editor; consultant to the World Health Organization and member of National Academy of Science Committee on Toxicology.

The Rotenone Stewardship Program evaluation (2001) of the Emory research concluded as follows: that the manner that rotenone was administered to the laboratory rats was highly unnatural. Not only was it administered by continuous jugular vein infusion but was also mixed with DMSO and PEG. DMSO enhances tissue penetration of many chemicals. Direct injection is the fastest way to deliver chemicals to the body, as evidenced in intravenous application of medicines. Continuous intravenous injection, as done in the Emory University study, also leads to continuous high levels of the chemical in the bloodstream. The normal exposure to rotenone in humans from its use in fisheries management would be ingestion, inhalation or through the skin.

The method of exposure in the Emory University study cannot be used as a model for any form of rotenone exposure resulting from its use in fisheries management (Rotenone Stewardship Program 2001). Rotenone exposure in the environment is extremely limited because rotenone is very unstable, is oxidized (neutralized) through enzymatic action in the gut of mammals and birds, is metabolized to water soluble compounds in the body, and these compounds are excreted by the liver and kidney. Because of the rapid metabolism and clearance in mammals and birds, it

is not likely that rotenone could reach the site of action in the substantia nigra in the brain where the dopamine is formed. Rotenone is toxic to fish because it is taken up rapidly across the gills and gets directly into the bloodstream, thus bypassing the gut. Rotenone is considered safe for the environment because it is not persistent and loses all its toxicity in a few days. In fact, it is significant that the Emory University investigators could not administer rotenone in any other manner except intravenously and get delivery of rotenone to the brain; otherwise, rotenone would have been neutralized in the gut and liver of the rats (Rotenone Stewardship Program, 2001).

Several researchers in Parkinson's disease (including J. Langston Director of the Parkinson's Institute) have stated that the Emory University study does not show direct evidence that rotenone causes Parkinson's disease (Rotenone Stewardship Program 2001). Adam (2000) reports in his update paper that Greenamyre does not believe the health risks from rotenone are particularly high. The U.S. Environmental Protection Agency has known for some time of the effects of rotenone on the nervous system when directly injected into animals. In 1993, the U.S. Environmental Protection Agency published the Workers Protection Standards Handbook that listed all the known effects of pesticides and necessary steps for treating pesticide poisoning (Pesticide Regulation Notice 93-7). In the Biologicals section of the handbook, the following statement is made, "When rotenone is injected into animals, tremors, vomiting, incoordination, convulsions, and respiratory arrest have been observed. These effects have not been reported in occupationally exposed humans."

Exposure to applicators applying rotenone in fisheries management is further minimized through the use of protective equipment such as air-purifying respirators, protective clothing (coveralls, gloves), eye protection (splash goggles or face shields) that are required on the product labels and by department safety protocol (Appendix B.). The Material Safety Data Sheets (MSDS, see below) for both the powder and liquid formulations indicate that rotenone is fatal if inhaled and may be fatal if ingested. This suggests that air purifying respirators are of paramount importance for applicator safety. Specific information on proper handling procedures and protective equipment are found on rotenone product labels.

Materials Safety Data Sheets

MSDS (Appendix D.) are required by the federal Occupational Safety and Health Administration (OSHA) to accompany all pesticides to be available for the use and protection of applicators. The MSDS provide information additional to the product labels on potentially hazardous ingredients in the product. This information is provided for the safety of the applicator who is exposed to higher concentrations of the material than is the general public when the material is applied and dispersed according to the label instructions. MSDS are required to be on site during department applications.

Inert Ingredients

The inert ingredients in the powdered rotenone product is plant fiber from the root of the plants ground-up to produce the product (Finlayson et al. 2000). Because of the low application rates

required for rotenone used in fisheries management, the entire plant root is ground up and packaged rather than extracting and/or concentrating the active chemical rotenone from the ground up roots. The plant fiber constitutes approximately 81.5% of the powder. Other associated plant resins amount to about 11.1% of the powder and active rotenone about 7.4% (Rotenone product label).

Brian Finlayson, a chemist with the California Department of Fish and Game has monitored nine projects in California lakes and streams treated with liquid rotenone formulations and powdered rotenone formulations since 1987 (Finlayson et al. 2001). The objectives of the studies were to address environmental and human health concerns. These studies monitored the distribution and persistence of rotenone and the degradation product, rotenolone, and other semivolatile (semiVOC) and volatile organic compounds (VOC) found in the liquid formulations in surface and ground waters. The liquid formulation contains petroleum hydrocarbons as solvents and emulsifiers to disperse rotenone in water (primarily naphthalene, methylnaphthalenes, trichloroethylene and xylenes).

The California researchers found that concentrations of trichloroethylene never exceeded the USEPA drinking water standard (Maximum Contaminant Level) of 5 Fg/L (USEPA 1985) and similarly the concentrations of xylene have never exceeded the drinking water standard (Health Advisory) of 620 Fg/L (USEPA 1981). Drinking water standards for naphthalene and methylnaphthalenes have not been established. The researchers found that these volatile and semivolatile organic compounds disappeared before rotenone dissipated, typically within 1 to 3 weeks. The volatile organic compounds do not accumulate in the sediments, and only naphthalene and the methyl naphthalenes temporarily (less than 8 weeks) accumulate in the sediments. All the measured concentrations of inert ingredients were well below the minimum concentrations allowed for drinking water standards developed by USEPA.

The California researchers encountered persistence of nearly 9 months (Table 1) with a chemical used in a liquid rotenone formulation that allows 2.5% active rotenone to be as effective as 5% active rotenone formulations for killing fish. This product is marketed as synergized liquid rotenone. Piperonyl butoxide is the ingredient used as the synergist. WDFW does not currently use the synergized rotenone product and has not used it since the 1970's. Agency fish biologists that tried the synergized formula encountered inconsistent results in Washington waters. The biologists felt that results were more predictable with the standard rotenone formulations (WDFW unpublished data).

Table 1 below, presents a summary of the California information.

Table 1. Persistence of rotenone and other organic compounds in water and sediment in impoundments treated with 2 ppm rotenone formulation (Finlayson et al. 2000)				
Compound	Initial water concentration (parts per billion)	Water persistence	Initial sediment concentration (parts per billion)	Sediment persistence
Rotenone	50	<8 weeks	522	<8 weeks
Trichloroethylene	1.4	<2 weeks	ND*	
Xylene	3.4	<2 weeks	ND	
Trimethylbenzene	0.68	<2 weeks	ND	
Naphthalene	140	<3 weeks	146	<8 weeks
1-m-naphthalene	150	<3 weeks	150	<4 weeks
2-m-naphthalene	340	<3 weeks	310	<4 weeks
Toluene	1.2	<2 weeks	ND	
Piperonyl butoxide	30	<9 months	ND	
*ND=below detection limits				

Ground Water Effects

The 1992 FSEIS review found no literature on groundwater effects from rotenone applications. This review found one reference for work done by the California Department of Fish and Game.

Twenty six wells adjacent to the nine California treatments have been monitored since 1987 for the presence of rotenone formulation constituents (Finlayson et al. 2001). Samples were collected between 1 and 456 days following treatments. All samples proved to be negative. Residues of rotenone or rotenolone were never found in any of the wells monitored. None of the other VOC or semiVOC constituents have been detected in any of the wells monitored. The ability of rotenone to move through soil is low to slight. Rotenone moves only 2 cm (<1 inch) in most types of soil. An exception would be in sandy soils, where movement is about 8 cm (slightly more than 3 inches). Rotenone binds strongly with organic materials in the soil and degrades rapidly.

Potassium Permanganate

Rotenone usually degrades naturally within one to four weeks depending on pH, alkalinity, temperature, and dilution with untreated water (Schnick, 1974). Occasionally there is a need to quickly neutralize rotenone treated waters or the discharge from treatment targets where downstream reaches need to be protected. Potassium permanganate is the chemical most often used to quickly neutralize rotenone formulations (Finlayson et al. 2000). The rotenone label also allows the use of chlorine for neutralization. Potassium permanganate can be applied by two methods. The crystals can be dissolved in water and the solution dripped or the crystalline chemical can be metered into the receiving water. Archer (2001) found that the free flowing crystalline form used in potable water treatment plant applications was the best product to use for dripping the crystalline form. He stated the ease of controlling application rates as the

advantage.

Environmental Effects

Potassium permanganate (KMnO_4) is a strong oxidizer, non-volatile, non-flammable and stable under normal conditions (Finlayson et al. 2000). On reaction, it breaks down into potassium, manganese, and water. These are all common in nature and have no deleterious environmental effects at the concentrations normally used to neutralize rotenone. Archer (2001) reports that the amount of KMnO_4 to be used depends on how rapidly the rotenone is to be neutralized.

KMnO_4 is toxic to fish at relatively low concentrations (2 to 10 ppm) under some circumstances and is much more toxic in alkaline waters than soft water (Archer 2001). Potassium permanganate breaks down rapidly in the natural environment thus a short plume of toxic KMnO_4 immediately below the target zone can be expected. A toxic plume of rotenone may however extend for many miles downstream of the target area. Archer (2001) reports that with KMnO_4 concentrations properly balanced with rotenone concentrations and the water's organic demand (or chlorine demand), toxic KMnO_4 levels can be reduced in a matter of minutes through the oxidation of organic components and rotenone in the water.

Human Health Effects

Hazardous exposure to potassium permanganate may occur via inhalation, ocular or dermal routes (Finlayson et al. 2000). Thus, using KMnO_4 requires precautions to ensure that applicators do not come in contact with the chemical, and to avoid spontaneous combustion from contact with combustible materials. The chemical is caustic to the mucous membranes of the nose and throat and causes brown stains on the skin and clothing on contact when dissolved in water. Potassium permanganate is dusty thus the MSDS suggests that it should not be handled without protective clothing and breathing apparatus. The dry material is inert, but becomes active once dissolved in water. The chemical must be kept away from organic materials such as gasoline, oils, alcohols, or any other oxidizable material. It also reacts with many metals when dissolved. MSDS for potassium permanganate (Appendix D) are required to be with all applicators.

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APPENDIX A.

Glossary

Glossary and Common Abbreviations

DJ/WB	Dingell-Johnson/Walop-Breaux: Federal tax collected on fishing and hunting equipment and marine fuels. Funds apportioned to States based on recreational license sales
DMSO	Dimethyl sulfoxide: A solvent used in medicine that diffuses rapidly through the skin.
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency (U.S.)
FSEIS	Final Supplemental Environmental Impact Statement
MSDS	Material Safety Data Sheet: OSHA required safety information on chemicals or pesticides provided for the safety of the applicator.
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollution Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PAPR	Powered Air Purifying Respirator
PEG	Polyethylene glycol: an organic solvent used in medicine.
Piscicide	Fish poison such as rotenone and antimycin
PPE	Personal Protective Equipment
ppm	Parts per million (equivalent to mg/L or mg/kg)
SemiVOC	Semi-volatile Organic Compound: mainly petroleum-based substances that vaporize into air
SEPA	State Environmental Protection Act
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound: Mainly petroleum-based substances that vaporize freely into air.

APPENDIX B.

Pre-rehabilitation Proposal and Post Rehabilitation Report

PRE-REHABILITATION FORM

1. Water Big Meadow Lake Location 7 N 43E Pend Oreille
(Sec) (Twp) (Rge) (County)
2. Surface Acres 72 Max. Depth 20ft Volume (Wt) 1,405,981,360 #
3. Date Last Rehabilitated None Toxicant Used None
4. Proposed Treatment Date 10/97 Est. Replant Date 4/98 Fry 10K
Legal 10,000 Species Rainbow
5. Propose Toxicant Rotenone Concentration 1ppm Amount (at 5% act. Ingrid.)
1,400# 20 gal liq. Method of Application tow sacks/spray Target Species yellow
perch Objective: Complete X Partial ___
6. Proposal for Salvage/Disposal None
7. Outlet: Permanent ___ Intermittent X Dry ___ Stream Miles/Flow ___
Measures to Protect Downstream Resources Outlet is dry in Oct.
If None, Why ___ Type Detoxinant if Used ___
Duration of Beneficial Effects 10 yrs
8. Does Water Contain Rare, Endangered, or Endemic Species No
If So, Describe Measures for Protection ___
9. Public Access Yes Developed Yes Major Land Ownership (%) Public 100%,
Private ___
10. Established Resorts None
11. Is Water used for Domestic, Industrial, or Irrigation (Registered Water Right) No
12. Public Attitude (Pro/Con%) Shoreline Residents ___ Non-Shoreline Resident
Sports Clubs Public Meeting To be held
13. Human use of water Fishing
14. Does Lake suffer Algae Blooms No Winter or Summer Kills Yes
15. Justification for this Rehabilitation: Illegally introduced yellow perch have overpopulated
the lake and trout growth has been stunted

Curt Vail 1/4/97
Biologist Date

Region Number 1

PRE-REHABILITATION PLAN

1. PROPOSAL:

A. Justification for proposed rehabilitation

1. Big Meadow Lake was contaminated with yellow perch in the early 1990s. Since then the trout have become stunted. Rainbow trout fry planted in the spring of 1995 were nine inches and robust in October of that year.
2. Rainbow planted in the spring of 1996 barely reached eight inches and the once large perch were stunted.
3. Big Meadow Lake is located approximately twenty miles North of Colville, Wa.

B. Physical Description

1. Name of water: Big Meadow Lake
2. Location: sec. 7 T34N R43E
3. Surface acres: 72
4. Maximum depth: 20 ft
5. Volume of water: 504 acre ft.
6. Outlet statistics: Intermittent. A trickle tube at a manmade dam stops flowing in the fall. An emergency overflow is active during spring runoff. These are normally dry in the fall.
7. Stream miles: NA
8. Number of developed access areas: One developed Forest Service campground and boat launch and one primitive boat launch.
9. Land ownership: 100% USFS
10. Resorts: None

C. Proposed Management Action

1. Date of last rehabilitation: None, although the lake has a history of winter kill. Wet weather in recent years has helped maintain fish through the last two winters. A lake aerator is used in all other years.
2. Toxicant used: None
3. Proposed treatment date: October 1997
4. Estimated replant date: April 1998
5. Species to restock: Rainbow
6. Number of fry, legal to stock: 10,000 fry and 10,000 legal.
7. Proposed toxicant name, concentration, and amount: Rotenone, 1ppm, 1,400 # and 20 gal. Liquid.
8. Method of application: Tow sacks and spray liquid.
9. Size of crew and number of crew members: Four boats and five crew members.
10. Name of licensed applicator: Bob Peck

II. PURPOSE

Big Meadow Lake has had extensive recreational development done to accommodate fishing, hunting, and appreciative wildlife users. It is a popular water and offers a quality fishing opportunity. The yellow perch have all but eliminated this opportunity.

III. INTENDED OUTCOME/MEASURE OF SUCCESS

A 100% removal of all fish/trout growth and quality returned to former high quality.

IV. RESOURCE IMPACTS

1. Target species: Yellow perch.
2. Detailed impacts to other wildlife: Due to the fall timing of the treatment, waterfowl use won't be affected, osprey will have migrated, and amphibians will be in adult lifestages.
3. Detailed potential impacts to human related uses of water or shoreline: Fishing season is over at the end of October and the campground is only used by hunters. No water activities occur.
4. Describe impacts to downstream resources: None
5. List any endemic species and or species which are rare, endangered or otherwise listed: None known.

V. MITIGATION FOR IMPACTS

1. Describe how impacts can be mitigated or softened: None.
2. Describe measures to protect downstream resources: None required.
3. Describe measures to protect endemic species, and/or species which are rare, endangered or threatened: None required.
4. Describe the safety precautions for pesticide applicators that will prevent health hazards: Respirators and protective clothing will be worn.
5. Describe how the area will be closed to the public during application: Boat launch and shoreline access points will be posted.

VI. RECREATIONAL IMPACT

Improved fishing opportunity.

VII. ECONOMIC IMPACT

Big Meadow Lake has had extensive recreational improvements done by the USFS. Hunting, fishing and appreciative fish and wildlife use have been encouraged. Economic benefits will accrue to the small communities of Ione, Metalline and Metalline Falls through increased use of recreational purchases, restaurants and gas.

VIII. 7,000 catchable rainbow will be stocked in April 1999 and 10,000 rainbow fry in May 1999.

IX. A public meeting will be held in June or July of 1998.

WATER MANAGEMENT PLAN

A. Water: Big Meadow Lake Mucode: 43LXE7 Wacode: Update
Management Area: NE Washington

B. STEWARDSHIP

Gamefish___ Foodfish___ Unclassified Fish___ Other___

5. Management Objective_____

Escapement Objective_____

6. Management/Regulatory Strategy:_____

AND/OR

B. UTILIZATION

1. Target Species: Mixed___ Trout Only X Warmwater___ Carp/Crawfish___ Other___

2. Fishery Objective: Production X Trophy___ Other___

3. Catch Objective: OD/Sea

Spp. Rb Catag Fry Fish/Hr 1 # Fish/angler 5 Ave Size 10" OD

4. Angler Use Objective (#Anglers/Acre): Opening Day: 5 Season 5

Comments: This lake is a relatively high elevation lake and is rather cold opening days. Use at that time is low.

5. Production Strategy:

Spp. Rb #Fish/Acre 140 #Fish/Pound 80 Plant Month May

6. Regulation Strategy: Retain lowland lake trout season and statewide regulations.

7. Comments:_____

WATERS GENERAL INFORMATION SUMMARY

A. WATER:

Updated

1. Name: Big Meadow Lake Alt. Name _____ County: Pend Oreille 1997
2. Water Type: L. Lake X Alpine Lk__ Beaver Pd.__ Stream__ Reservoir__
3. Mucode: 43LXE7 Wacode: _____ WRIA# _____ Sec 7 Twp 37N Rge 43E

B. PHYSICAL INFORMATION:

1. Elev: 3450 Ave Depth/Width: 7 ft Max Depth: 20 ft Acres: 72
2. Physical Location: Twenty miles N of Colville WA
3. Land Ownership: Public 100% Private % Land Use: Agricultural %
Residential %(No. Nearshore homes) Managed
Timberland 100% Other %
4. Public Access Types & Condition: Two developed camp grounds, boat launch
and handicapped fishing dock. Resorts: None
5. Inlets: One intermittent inlet
6. Outlet: ScreenY/N (Drains to):Screened, drains to Meadow Cr. and S. Deep Cr.
7. Habitat Description (%Shoreline Vegetation, Trophic State, Secci Disk): 80%,
Mesotrophic, 12 ft.
8. Water Chem: Alkalinity Ca pH 8 Specific Cond. (Micromhos) .
9. Comments:

C. GENERAL MANAGEMENT INFORMATION

- | | | |
|------|--|------|
| 1997 | 1. Current Regulations: <u>Lowland Lk. Season/statewide regs</u> | |
| 1997 | 2. Stocking: <u>Normally stocked with 7-10,000 trout fry</u> | |
| 1997 | 3. Fish known to be present: <u>Include all Gamefish, Foodfish, Unclassified fish, Crawfish Rb, E br, yp</u> | |
| 1997 | 4. Anadromous Fish Use: (Spawning, Rearing, Passage) <u>None</u> | 1997 |
| 1997 | 5. Management History Summary: <u>Until the early 1980s the lake was privately Owned. It was then acquired by the Colville National forest and the Dept. of Game stocked it with trout. It was most recently stocked with rainbow trout.</u> | |
| 1997 | 6. Management Issues Summary: <u>This lake winterkills in most winters. It is maintained during the winter with a lake aerator.</u> | |
| | T&E Flora and Fauna: <u>None known</u> | |

POST REHABILITATION FORM

1. Lake or Stream Big Meadow County Pend Oreille
Section 7 Township 37N Range 43E
2. Lakes - surface acres 72 Miles of inlet/outlet dry of outlet
3. Maximum depth 20 ft. Average depth 10ft.
4. Weight(pounds) of water treated 1,405,981,360# toxicant Rotenone
5. Amount used 1,400 lbs. 20gal. Liquid; 7.0 % active ingredient
6. Concentration applied 1.0 P.P.M. Date treated 10/30/98

7. Man-hours expended in preparation, treatment & cleanup 32
8. Conditions in the lake on dat of treatment:

<u>Depth in ft.</u>	<u>Temperature</u>	<u>PH</u>	<u>Dissolved oxygen</u>
Surface	34F.	8	8.5
5ft.	40F.	8	8.4
10ft.	40F.	8	8.3
20ft.	40F.	8	2.5

9. Species of fish eradicated in order of relative abundance:

Yellow perch
Rainbow trout

10. Possibility of a complete kill: 100%

11. Detoxicant used None

12. Period of toxicity One month

13. Description of treatment and other comments: The treatment

began at 1000 on the 30th and was completed by 1800. Three boats
and a pumper were used with assistance from one additional
person. The weather was clear

Due to cold temperatures the perch were slow to appear but by 1800 they were stressing lake-
wide. Trout were few since the lake had not been stocked since 1997.

Curt Vail 11/10/97
Fishery Biologist Date

Region Number I

APPENDIX C.

Lake Rehabilitation Safety Procedures



Personnel Office - Safety & Risk Management

600 Capitol Way North / Olympia, WA 98501-1091
(360)-902-2275 / Fax (360)-902-2392

MEMO

DATE: February 3, 2001
TO: Jim Uehara
FROM: Scott Loerts - WDFW Safety Officer
SUBJECT: Lake Rehabilitation Safety Procedures

When WDFW employees and volunteers are involved in lake rehabilitation projects where the use of cube root and liquid nox-fish rotenone pesticides are used, the following procedures will be followed:

- 1) The US EPA considers the chemicals used by WDFW staff in lake rehabilitation projects to be registered pesticide products. It is a violation of federal law to use these products in a manner inconsistent with the pesticide label.
- 2) The use of formulated rotenone products must be supervised on-site by at least one person who has a Washington State certification as a pesticide applicator. This project supervisor must have the authority to start and stop the rotenone application and be well versed in the state regulatory requirements regarding the safe and legal use of the rotenone product and applicator safety.
- 3) All personnel (employees and volunteers) involved with the rotenone application must receive safety training specific to the formulated rotenone products that will be used. Please follow the guidelines for the Hazard Communication Program set forth in the department's Safety Program Manual. At the minimum, specific safety training must include information on the following: (1) how to read and understand the product label; (2) the acute and chronic applicator exposure hazards; (3) routes & symptoms of pesticide overexposure; (4) how to obtain emergency medical care; (5) decontamination procedures; (6) how to use the required safety equipment; (7) safety requirements and proper procedures for pesticide handling, transportation, storage and disposal. Training records must be maintained in accordance with federal and state regulatory requirements.

4) Personal Protective Equipment (PPE) is required by the product label and the material safety data sheet when using formulated rotenone pesticide products. The following PPE requirements for rotenone pesticide products should be followed:

For dry cube root applications - To reduce respiratory exposure to the rotenone powder, employees should wear a NIOSH approved N95 filtering face piece or half face negative pressure air purifying respirator with P100 hepa filter cartridges. Safety goggles, chemical resistant gloves (nitrile) and tyvek overalls should also be worn to avoid dangerous dermal exposure.

For liquid nox-fish applications - To reduce respiratory exposure to the liquid nox-fish rotenone formulation, employees should wear a NIOSH approved half or full face negative pressure air purifying respirator using organic vapor cartridges approved for pesticides combined with a P100 hepa cartridge. Respirator cartridges are to be changed at the end of each work day. Safety splash goggles, nitrile chemical gloves and tyvek coveralls should be worn to reduce dermal exposure to the nox-fish liquid.

5) Employees who are assigned to use respirator equipment must be included in the Department's respiratory protection program. The program requires all respirator users to complete a confidential medical questionnaire to be reviewed by a contracted medical professional. Once the medical contractor advises the Department on the employees capability to use respirator equipment, the employee must then complete respirator use training and fit testing. The fit test and training must be repeated annually and records maintained.

6) The lake rehabilitation project must always include an employee with first aid & CPR training. First aid supplies, an emergency eye wash shower and emergency plan procedures must also be present.

7) The transportation and future disposal of rotenone products must meet all federal DOT, EPA and state Department of Ecology requirements.

Further information on these safety requirements can be obtained from contacting WDFW safety officer, Scott Loerts at 360-902-2275.

APPENDIX D.

Materials Safety Data Sheets

Material Safety Data Sheet
U.S. Department of Labor (OSHA 29 CFR 1910.1200)

Section 1: Product and Company Identification

Product: 655-691 Prentox® Prenfish™ Fish Toxicant Powder

Manufacturer's Name: Prentiss Incorporated
 C. B. 2000
 Floral Park, NY 11001
Telephone Number: (516) 326-1919

Section II: Composition/Information on Ingredients

Ingredient Name:	OSHA PEL	ACGIH TLV	%
Rotenone (CAS # 83-79-4)	(TWA) 5 mg/M ³	(TWA) 5 mg/M ³	7.4
Other Cube Resins	None	None	11.1
Other Ingredients	None	None	81.5

Section 3: Hazards Identification:

Emergency Overview:

A brown powder with a faint botanical odor that:

- Is fatal if inhaled
- May be fatal if swallowed
- Is harmful if absorbed through the skin
- Causes moderate eye irritation
- May cause allergic skin reactions in some individuals
- Is extremely toxic to fish

Potential Health Effects:**Primary Route(s) of Entry:**

Ingestion, inhalation, and skin contact

Eyes:

Causes moderate eye irritation

Skin:

Harmful if absorbed through the skin. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals.

Ingestion:

May be fatal if swallowed

Inhalation:

Fatal if inhaled

Chronic (cancer information):

Rotenone may cause damage to the liver and kidneys. Rotenone is not considered carcinogenic

Teratogenicity (Birth Defects):

Rotenone is not teratogenic or fetotoxic

Reproductive Effects:

Rotenone has no adverse effects on reproduction

Mutagenicity (Genetic Effects):

Rotenone is not mutagenic

Signs and Symptoms:

May cause irritation of the eyes, nose and throat in addition to temporary numbness. Prolonged or repeated exposure can cause nausea, vomiting, abdominal cramps, muscle tremors, poor muscle coordination, seizures, shallow breathing, skin rashes and eye, nose and mouth lesions.

Section 4: First Aid Measures:

Eyes:

Flush eyes with plenty of water for 15 minutes. Get medical attention if irritation persists

Skin:

Wash with plenty of soap and water. Get medical attention if irritation persists

Ingestion:

Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person

Inhalation:

Remove person to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention

Note to Physician:

If a small amount is ingested (or if treatment is delayed), oral administration of large amounts of activated charcoal and a cathartic is probably sufficient therapy

Do not administer milk, cream or other substances containing vegetable or animal fats, which enhance the absorption of lipophilic substances

Section 5: Fire Fighting Measures:

Extinguishing Media:

Carbon dioxide, dry chemical, foam or water

Fire Fighting Instructions:

As in any fire, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH approved (or equivalent), and full protective gear.

Section 6: Accidental Release Measures:

Sweep or shovel spilled material into a tightly sealed container. Dispose of with chemical waste.

Section 7: Handling and Storage:

Handling Precautions:

Do not breath dust or spray mist
Avoid contact with eyes, skin or clothing

Storage Precautions:

Store in a dry place, away from excessive temperature extremes

Work/Hygienic Practices:

Wash thoroughly and immediately after handling. Smoking, eating and drinking should not be permitted before changing clothing and washing after handling

Section 8: Exposure Controls/Personal Protection:

Eye/Face Protection:

Chemical goggles

Skin Protection:

Impervious gloves

Respiratory Protection:

Use a dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C)

Other/General Protection:

Protective apron, long sleeves and pants to prevent skin contact

Section 9: Physical and Chemical Properties:

Appearance:

Brown powder

Odor:

Faint botanical odor

Basic Physical Properties:

Physical State: Powder

Solubility (H₂O): Insoluble

Bulk Density: Fluffed – 0.29 to 0.35 gm/cm³, Packed – 0.43 to 0.58 gm/cm³

Section 10: Stability and Reactivity:

Stability: Stable

Conditions to Avoid (Stability): High temperatures and constant exposure to sunlight

Incompatible Materials: Avoid strong oxidizers and reducing agents

Hazardous Polymerization: Will not occur

Section 11: Toxicological Information:

Eye Effects:

Irritation (Rabbit): Moderately irritating

Skin Effects:

Irritation (Rabbit): Slightly irritating

Absorption (Rabbit): LD₅₀ > 2,020 mg/kg

Sensitization (Guinea Pig): Positive

Acute Oral Effects:

LD₅₀ (Rat, male): 874 mg/kg

(Rat, female): 99.2 mg/kg

Acute Inhalation Effects:

4 hour LC₅₀ (Rat): 0.056 mg/L

Chronic (Cancer) Information:

Rotenone was not carcinogenic when tested in rats and mice

Carcinogenicity: **NTP:** No **IARC:** No **OSHA:** No

Teratogenicity (Birth Defects):

Rotenone was not teratogenic or fetotoxic when tested in rats and mice

Reproductive Effects:

Rotenone had no adverse effects on reproduction when tested in the Ames Test, Yeast Test, Mouse Lymphoma Test, Mouse Micronucleus Test, Chromosome Aberration Test and the Mitotic Recombination Test in Yeast

Section 12: Ecological Information:

Other Environmental Information:

This pesticide is extremely toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA

Section 13: Disposal Considerations:

Pesticide Disposal:

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility

Container Disposal:

Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration or, if allowed by State and local authorities, by burning. If burned, stay out of smoke

Section 14: Transport Information:

Proper Shipping Name: Pesticide, Solid, Toxic, n.o.s. (Rotenone)

Hazard Class: 6.1, PG I

DOT Identification Number: UN2588

DOT Shipping Label: POISON

Additional Shipping Paper Description: Marine Pollutant

1 hour LC₅₀ (Rat) equivalent: 0.224 mg/L (dust)

Section 15: Regulatory Information:

Regulated Ingredients:

Ingredient: Rotenone

CAS Number: 83-79-4

Percent by Weight: 7.4

Regulations:

Illinois Toxic Substances
Massachusetts Hazardous Substance
New Jersey Special Health Hazardous Substance
New Jersey Workplace Hazardous Substance
Pennsylvania Workplace Hazardous Substance

Section 16: Other Information:

NEPA Hazard Rating:

Health: 2 – Moderate

Fire: 1 – Slight

Reactivity: 0 – Negligible

Special:

HMIS Hazard Rating:

Health: 2 – Moderate

Fire: 1 – Slight

Reactivity: 0 – Negligible

Protection: J

Date Prepared: November 3, 1997

Supersedes: August 26, 1992

Reason: Complete Revision

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

Product: 655-422 Prentox® Prenfish™ Toxicant

**Material Safety Data Sheet
U.S. Department of Labor (OSHA 29 CFR 1910.1200)**

Manufacturer's Name: Prentiss Incorporated
C. B. 2000
Floral Park, NY 11001
Telephone Number: (516) 326-1919

Section 1: Chemical Identification

Product: 655-422 Prentox® Prenfish™ Toxicant
EPA Signal Word: DANGER

Active Ingredient (%): Rotenone (5%) (CAS # 83-79-4)
Other Cube Resins (10%) N/A
Chemical Names: Rotenone – N/A
Chemical Class: Mixture

Section 2: Composition/ Information On Ingredients

Material:	OSHA	ACGIH	NTP/IARC/OSHA	
	PEL	TLV	Other	Carcinogen
Rotenone	(TWA) 5 mg/ M ³	(STEL) 10 mg/M ³ (TWA) 5 mg/M ³		No/No/No
Other associated cube resins	Not Est.	Not Est.		
Aromatic Petroleum Solvent (Supplier recommendation 100 ppm) (CAS # 64742-94-5) (Not to exceed 80%)				
Contains the following ingredients, by weight (typical):				
Naphthalene (CAS # 91-20-3)	9.9%		(TWA) 10 ppm	
1,2,4-trimethylbenzene (CAS # 95-63-6)	1.7%		(TWA) 25 ppm	
Acetone (CAS # 67-64-1) (not to exceed 7.5%)			(TWA) 250 ppm	
Emulsifier #1 (CAS # N/A)		1.5%		N/D
Emulsifier #2 (CAS # N/A)		4.5%		N/D

Section 3: Hazards Identification

Clear liquid with mild odor. Fatal if inhaled. May be fatal if swallowed. Harmful if absorbed through skin. Causes substantial but temporary eye injury. Causes skin irritation. This pesticide is extremely toxic to fish.

Potential Health Effects:

Primary Routes of Entry: Inhalation, ingestion, skin and eye contact.

Health Hazards (Acute and Chronic): Causes mucous membrane irritation. Chronic exposure can cause damage to liver and/or kidneys. May be fatal if swallowed. May cause eye injury. Causes skin irritation. Do not get in eyes, on skin or on clothing. Toxicity of other components: This product contains an aromatic solvent.

Inhalation of solvent vapors at high concentrations are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death. Aspiration of solvent during vomiting may cause mild to severe pulmonary injury, possibly progressing to death. Frequent or prolonged skin contact may irritate and cause dermatitis. Skin contact may aggravate an existing dermatitis condition. Emulsifiers may cause severe eye injury.

Signs and Symptoms of Overexposure: Can cause skin irritation. Ingestion or inhalation can cause numbness, nausea, vomiting and tremors.

Medical Conditions Generally Aggravated by Exposure: None known.

Section 4: First Aid Measures

If swallowed, call a physician or Poison Control Center. Do not induce vomiting. This product contains aromatic petroleum solvent. Aspiration may be a hazard. Promptly drink a large quantity of milk, egg white, and gelatin solution, or if these are not available, water. Avoid alcohol.

If inhaled, remove victim to fresh air. If not breathing, administer artificial respiration, preferably by mouth to mouth. Get medical attention.

If on skin, wash with plenty of soap and water. Get medical attention if irritation persists.

If in eyes, flush eyes with plenty of water. Get medical attention if irritation persists.

Section 5: Fire Fighting Measures

Fire and Explosion

Flash Point (Method Used): 60° F. Closed cup.

Flammable Limits: LEL: 1.8 UEL: 11.7 (Solvent - approximate)

NFPA Hazard Ratings: Health: 3 Flammability: 4 Reactivity: 0

Extinguishing Media: CO₂, foam, dry chemical, or water spray.

Special Fire Fighting Procedures: Do not inhale smoke. Use self-contained breathing apparatus and protective clothing. This product is extremely toxic to fish, and is toxic to birds and other wildlife, prevent spread of contaminated runoff.

Unusual Fire and Explosion Hazards: When heated to decomposition, product emits acrid smoke and fumes.

Flammability Classification/Rating:

NFPA/OSHA Class: I

NFPA Rating (Fire): 4

Section 6: Accidental Release Measures

Wear protective equipment, as required, to prevent contact with product or its vapors. Cover the spilled material with generous amounts of absorbent material, such as clay, diatomaceous earth, sand or sawdust.

Sweep the contaminated absorbent onto a shovel and put the sweepings into a salvage drum. Dispose of wastes as below. Place any leaking container into a similar drum or glass container. Mark the drum or container with name of product, ingredient statement, precautionary statements and signal word. Contact us for replacement label. This product is extremely toxic to fish. Fish kills are expected at recommended rates. Keep it out of lakes, streams or ponds except under use conditions.

Section 7: Handling and Storage

Do not contaminate water, food or feed by storage or disposal. Store in a dry place away from temperature extremes. Avoid inhalation of vapors. Harmful if swallowed, inhaled or absorbed through skin. Avoid contact with skin. Wear clean protective clothing.

Other precautions: Periodically inspect stored materials.

Section 8: Exposure Controls/Personal Protection

Respiratory protection: Mixers and handlers: Do not inhale. Use NIOSH certified respirator for organic vapor protection.

Ventilation:

Local Exhaust: As required to meet TLV.

Special: Not applicable.

Mechanical: As required to meet TLV.

Other: Not applicable.

Protective Gloves: Chemical resistant.

Eye Protection: Safety glasses, face shield or goggles.

Other protective clothing or equipment: Wear long pants, long sleeved shirt or other body covering clothes. Avoid skin or eye contact.

Work/Hygienic practices: Wash thoroughly after handling and before eating or smoking. Remove contaminated clothing and wash thoroughly before reuse.

Section 9: Physical and Chemical Properties

Appearance:	Amber Liquid
Odor:	Aromatic Solvent Odor
Boiling Point:	N/D
Specific Gravity (H₂O = 1):	0.9226
Vapor Pressure (mmHg):	N/D
Melting Point:	N/D
Vapor Density (Air = 1):	N/D
Evaporation Rate (Butyl Acetate = 1):	N/D
Solubility in Water:	Emulsifies.

Section 10: Stability and Reactivity

Stability:	Stable.
Conditions to avoid for stability:	None.
Incompatibility:	Strong acids and oxidizers.
Hazardous Decomposition or Byproducts:	CO, CO ₂
Hazardous Polymerization:	Will not occur.
Conditions to avoid for Hazardous Polymerization:	None.

Section 11: Toxicological Information

Acute Toxicity/Irritation Studies:

(The following data were developed with Prenfish)

Ingestion:	Oral LD ₅₀	55.3 mg/Kg (Rat – female) 264 mg/Kg (Rat – male) 178 mg/Kg (Rat – overall)
Dermal:		>2020 mg/Kg (Rabbit) (Slightly toxic)
Inhalation:		4-hour LC ₅₀ 0.048 mg/l. (Rat) (Highly toxic)
Eye Contact:		Moderately irritating (Rabbit)
Skin Contact:		Moderately irritating (Rabbit)
Skin Sensitization:		Non-sensitizing (Guinea Pig)

(The following data were developed with rotenone technical)

Mutagenic Potential: Rotenone was not mutagenic when tested.

Reproductive Hazard Potential: Rotenone had no reproductive effects when tested

Chronic/Subchronic Toxicity Studies:

Cancer Information: Rotenone was not carcinogenic when tested in rats and mice.

Toxicity of Other Components:

Petroleum solvent: The supplier reports that inhalation of high vapor concentrations (over 1,000 ppm) may cause nervous system effects such as headaches, dizziness, anesthesia and respiratory tract irritation

Surfactant: Causes severe eye irritation, which could lead to permanent eye damage. Prolonged or repeated skin contact may cause discomfort and local redness. Mist can irritate the respiratory tract, experienced as nasal discomfort and discharge with chest pain and coughing.

Target Organs: Eyes, skin, respiratory tract.

Section 12: Ecological Information

Summary of Effects: This product is extremely toxic to fish. Fish kills are expected at recommended rates.

Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

Section 13: Disposal Considerations

Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities.

Section 14: Transport Information

DOT Classification: Pesticide liquid, flammable, toxic, n.o.s. (Rotenone, Acetone)

Hazard Class: 3, PG I

Subsidiary hazard class: 6.1

DOT Shipping Label: Poison and/or Toxic

Note: For transport purposes (49FR Part 173.132), the calculated 1-hour LC50 (Rat) is: 0.192 mg/L

Section 15: Regulatory Information

SARA Title III Classification:

Section 311/312:

Acute health hazard

Fire hazard

Section 313 Chemicals:

Aromatic Petroleum Solvent (Supplier recommendation 100 ppm) (CAS # 64742-94-5)

(Not to exceed 80%)

Contains the following ingredients, by weight (typical):

Naphthalene (CAS # 91-20-3)	9.9%	(TWA) 10 ppm
1,2,4-trimethylbenzene (CAS # 95-63-6)	1.7%	(TWA) 25 ppm

This product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372. Any copies or redistribution of this MSDS must include this notice.

Proposition 65: This product does not contain any chemical which is known to the State of California to cause cancer or birth defects or other reproductive harm.

CERCLA Reportable Quantity (RQ): None.

RCRA Classification: Ignitable.

TSCA Status: Registered pesticide, exempt from TSCA regulation. All ingredients are on the TSCA inventory.

Other: Rotenone

Illinois toxic substance

Massachusetts Hazardous Substance

New Jersey Special Health Hazardous Substance

Pennsylvania Workplace Hazardous Substance

Acetone

Massachusetts Hazardous Substance

New Jersey Environmental Hazardous Substance

New Jersey Special Health Hazardous Substance

New Jersey Workplace Hazardous Substance

Pennsylvania Workplace Hazardous Substance

Section 16: Other Information

NFPA Hazard Ratings:

Health:	3	0	Least	
Flammability:	4	1	Slight	
Reactivity:		0	2	Moderate
			3	High
			4	Severe

Date Prepared: August 10, 2000

Supersedes: February 2, 1994

Reason: Revised Format

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

MSDS**Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



Mallinckrodt
CHEMICALS



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

POTASSIUM PERMANGANATE

MSDS Number: P6005 --- *Effective Date: 11/17/99*

1. Product Identification

Synonyms: Permanganic acid, potassium salt; Condyl's crystals

CAS No.: 7722-64-7

Molecular Weight: 158.03

Chemical Formula: KMnO₄

Product Codes:

J.T. Baker: 3227, 3228, 3232

Mallinckrodt: 7056, 7068

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Potassium Permanganate	7722-64-7	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.

CORROSIVE. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate

Flammability Rating: 0 - None

Reactivity Rating: 3 - Severe (Oxidizer)

Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Yellow (Reactive)

Potential Health Effects

Inhalation:

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. High concentrations can cause pulmonary edema.

Ingestion:

Ingestion of solid or high concentrations causes severe distress of gastro-intestinal system with possible burns and edema; slow pulse; shock with fall of blood pressure. May be fatal. Ingestion of concentrations up to 1% causes burning of the throat, nausea, vomiting, and abdominal pain; 2-3% causes anemia and swelling of the throat with possible suffocation; 4-5% may cause kidney damage.

Skin Contact:

Dry crystals and concentrated solutions are caustic causing redness, pain, severe burns, brown stains in the contact area and possible hardening of outer skin layer. Diluted solutions are only mildly irritating to the skin.

Eye Contact:

Eye contact with crystals (dusts) and concentrated solutions causes severe irritation, redness, blurred vision and can cause severe damage, possibly permanent.

Chronic Exposure:

Prolonged skin contact may cause irritation, defatting, and dermatitis. Chronic manganese poisoning can result from excessive inhalation exposure to manganese dust and involves impairment of the central nervous system. Early symptoms include sluggishness, sleepiness, and weakness in the legs. Advanced cases have shown symptoms of fixed facial expression, emotional disturbances, spastic gait, and falling.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Contact with oxidizable substances may cause extremely violent combustion.

Explosion:

Strong oxidants may explode when shocked, or if exposed to heat, flame, or friction. Also may act as initiation source for dust or vapor explosions. Contact with oxidizable substances may cause extremely violent combustion. Sealed containers may rupture when heated. Sensitive to mechanical impact.

Fire Extinguishing Media:

Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire. Suffocating type extinguishers are not as effective as water. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage and moisture. Isolate from any source of heat or ignition. Avoid storage on wood floors. Separate from incompatibles, combustibles, organic or other readily oxidizable materials. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

- OSHA Permissible Exposure Limit (PEL):

5 mg/m³ Ceiling for manganese compounds as Mn

- ACGIH Threshold Limit Value (TLV):

0.2 mg/m³ (TWA) for manganese, elemental and inorganic compounds as Mn

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Purple-bronze crystals.

Odor:

Odorless.

Solubility:

7 g in 100 g of water.

Density:

2.7

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

Not applicable.

Melting Point:

ca. 240C (ca. 464F)

Vapor Density (Air=1):

5.40

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Toxic metal fumes may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Powdered metals, alcohol, arsenites, bromides, iodides, phosphorous, sulfuric acid, organic compounds, sulfur, activated carbon, hydrides, strong hydrogen peroxide, ferrous or mercurous salts, hypophosphites, hyposulfites, sulfites, peroxides, and oxalates.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Investigated as a mutagen, reproductive effector. Oral rat LD50: 1090 mg/kg.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	

Potassium Permanganate (7722-64-7)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container

and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, POTASSIUM PERMANGANATE
Hazard Class: 5.1
UN/NA: UN1490
Packing Group: II
Information reported for product/size: 110LB

International (Water, I.M.O.)

Proper Shipping Name: POTASSIUM PERMANGANATE
Hazard Class: 5.1
UN/NA: UN1490
Packing Group: II
Information reported for product/size: 110LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Potassium Permanganate (7722-64-7)	Yes	Yes	Yes	Yes
-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	--Canada--		Phil.
Potassium Permanganate (7722-64-7)	Yes	Yes	No	Yes
-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302- RQ	TPQ	-SARA 313- List	Chemical Catg.
Potassium Permanganate (7722-64-7)	No	No	No	Manganese co
-----\Federal, State & International Regulations - Part 2\-----				
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)	
Potassium Permanganate (7722-64-7)	100	No	No	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: 2Y

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0 Other: **Oxidizer**

Label Hazard Warning:

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.
CORROSIVE. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED.

Label Precautions:

Keep from contact with clothing and other combustible materials.

Store in a tightly closed container.

Do not store near combustible materials.

Remove and wash contaminated clothing promptly.

Do not get in eyes, on skin, or on clothing.

Do not breathe dust.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

New 16 section MSDS format, all sections have been revised.

Disclaimer:

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THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Strategic Services Division

Phone Number: (314) 539-1600 (U.S.A.)

APPENDIX E.
Distribution List

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ENVIRONMENTAL REVIEW SECTION
ATTN: BARBARA RITCHIE
POST OFFICE BOX 47703
OLYMPIA WA 98504-7703

WA PARKS AND RECREATION COMMISSION
ATTN: DAVID HEISER
POST OFFICE BOX 42668
OLYMPIA WA 98504-2668

US ARMY CORPS OF ENGINEERS
SEATTLE DISTRICT
ATTN: REGULATORY BRANCH
PO BOX 3755
SEATTLE WA 98124-2255

US FISH AND WILDLIFE SERVICE
UPPER COLUMBIA RIVER BASIN FIELD OFFICE
11103 E MONTGOMERY DR., SUITE #2
SPOKANE WA 99206

US FOREST SERVICE
REGIONAL OFFICE - REGION 6
ATTN: ENVIRONMENTAL COORDINATOR
PO BOX 3623
PORTLAND OR 97208-3623

SEATTLE WA 98104

NATIONAL MARINE FISHERIES SERVICE
ATTN: MERRITT TUTTLE
525 NE OREGON ST, SUITE 500

510 DESMOND DRIVE SE, SUITE 103
LACEY WA 98503

ADAMS COUNTY PLANNING DEPARTMENT

ASOTIN COUNTY PLANNING COMMISSION
ATTN: ENVIRONMENTAL REVIEW
PO BOX 160
ASOTIN WA 99402

CHELAN COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
411 WASHINGTON ST
WENATCHEE WA 98801

CLARK COUNTY PLANNING DIVISION
ATTN: ENVIRONMENTAL REVIEW
PO BOX 5000
VANCOUVER WA 98668

WA DEPT OF NATURAL RESOURCES
SEPA CENTER
ATTN: DAVE DIETZMAN
POST OFFICE BOX 47015
OLYMPIA WA 98504-7015

WA DEPT OF TRANSPORTATION
POST OFFICE BOX 47440
OLYMPIA WA 98504-7440

US FISH AND WILDLIFE SERVICE
WESTERN WASHINGTON OFFICE
510 DESMOND DRIVE SE, SUITE 102
LACEY WA 98503

US ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL REVIEW SECTION
ATTN: JERRY OPATZ
1200 6TH AVE MAIL STOP WD-126
SEATTLE WA 98101

NATIONAL PARK SERVICE
ENVIRONMENT COORDINATOR
SEATTLE SUPPORT OFFICE
909 1ST AVENUE

PORTLAND OR 97232-2737

NATIONAL MARINE FISHERIES SERVICE
ATTN: ENVIRONMENTAL REVIEW

ATTN: ENVIRONMENTAL REVIEW
165 NORTH FIRST AVENUE
OTHELLO WA 99344

BENTON COUNTY PLANNING AND BUILDING
DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
PO BOX 910
PROSSER WA 99350

CLALLAM COUNTY DEPARTMENT OF COMMUNITY
DEVELOPMENT
ATTN: ENVIRONMENTAL REVIEW
223 EAST 4TH STREET
PORT ANGELES WA 98362-3098

COLUMBIA COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
114 S SECOND ST
DAYTON WA 99328-1341

COWLITZ COUNTY DEPARTMENT OF BUILDING AND
PLANNING
COUNTY ADMINISTRATION BUILDING
207 FOURTH AVENUE NORTH
KELSO WA 98626

FERRY COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
PO BOX 305
REPUBLIC WA 99166

GARFIELD COUNTY BOARD OF COMMISSIONERS
ATTN: ENVIRONMENTAL REVIEW
PO BOX 278
POMEROY WA 99347

GRAYS HARBOR PLANNING AND BUILDING
DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
PO BOX 390
MONTESANO WA 98563

JEFFERSON COUNTY PLANNING AND BUILDING
DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
PO BOX 1220
PORT TOWNSEND WA 98368

KITSAP COUNTY DEPARTMENT OF COMMUNITY
DEVELOPMENT
ATTN: ENVIRONMENTAL REVIEW
614 DIVISION STREET
PORT ORCHARD WA 98366

KLICKITAT COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
205 SOUTH COLUMBUS
GOLDENDALE WA 98620

LINCOLN COUNTY PLANNING DEPARTMENT
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RR 1 BOX 368
DAVENPORT WA 99122-9801

OKANOGAN COUNTY PLANNING DEPARTMENT
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OKANOGAN WA 98840

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NEWPORT WA 99156

DOUGLAS COUNTY REGIONAL PLANNING
COMMISSION
ATTN: ENVIRONMENTAL REVIEW
470 9th STREET NORTHEAST
EAST WENATCHEE WA 98802

FRANKLIN COUNTY PLANNING DEPARTMENT
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1016 NORTH 4TH AVENUE
PASCO WA 99301

GRANT COUNTY PLANNING DEPARTMENT
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PO BOX 37
EPHRATA WA 98823

ISLAND COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
PO BOX 5000
COUPEVILLE WA 98239

KING COUNTY DEPARTMENT OF DEVELOPMENT
AND ENVIRONMENTAL SERVICES
900 OAKESDALE AVE SW
RENTON WA 98055-1219

KITTITAS COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
COUNTY COURTHOUSE
ELLENSBURG WA 98926

LEWIS COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
350 N MARKET BLVD
CHEHALIS WA 98532

MASON COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
PO BOX 186
SHELTON WA 98584

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ATTN: ENVIRONMENTAL REVIEW
PO BOX 68
SOUTH BEND WA 98586

PIERCE COUNTY DEPARTMENT OF PLANNING AND
NATURAL RESOURCE MANAGEMENT
ATTN: ENVIRONMENTAL REVIEW
2401 SOUTH 35TH STREET SUITE 2
TACOMA WA 98409

SAN JUAN COUNTY PLANNING DEPARTMENT
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PO BOX 947
FRIDAY HARBOR WA 98250

SKAGIT COUNTY PLANNING DEPARTMENT
700 SOUTH SECOND ST ROOM 204
MOUNT VERNON WA 98273

SKAGIT COUNTY PUBLIC WORKS
ATTN: ENVIRONMENTAL REVIEW
1111 CLEVELAND
MT VERNON WA 98273-4215

SKAMANIA COUNTY PLANNING DEPARTMENT
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STEVENSON WA 98648

SNOHOMISH COUNTY DEPARTMENT OF PLANNING
AND COMMUNITY DEVELOPMENT
ATTN: ENVIRONMENTAL REVIEW
3000 ROCKEFELLER MS 710
EVERETT WA 98201-4060

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NORTH 721 JEFFERSON STREET
SPOKANE WA 99260

STEVENS COUNTY PLANNING & COMMUNITY
DEVELOPMENT
ATTN: ENVIRONMENTAL REVIEW
2515 SOUTH OAK, COURTHOUSE ANNEX
COLVILLE WA 99114

THURSTON COUNTY PLANNING DEPARTMENT
2000 LAKERIDGE DRIVE SW BLDG 1
OLYMPIA WA 98502

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ATTN: ENVIRONMENTAL REVIEW
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CATHLAMET WA 98612

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310 WEST POPLAR STREET SUITE 117
WALLA WALLA WA 99362

WHATCOM COUNTY PLANNING AND DEVELOPMENT
SERVICES
ATTN: ENVIRONMENTAL REVIEW
5280 NORTHWEST DRIVE
BELLINGHAM WA 98226

WHITMAN COUNTY PLANNING OFFICE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 430
COLFAX WA 99111

YAKIMA COUNTY PLANNING DEPARTMENT
ATTN: ENVIRONMENTAL REVIEW
COUNTY COURTHOUSE ROOM 417
YAKIMA WA 98901

NORTHWEST INDIAN FISHERIES COMMISSION
ATTN: ENVIRONMENTAL REVIEW
6730 MARTIN WAY EAST
OLYMPIA WA 98506

COLUMBIA RIVER INTER-TRIBAL FISHERIES
COMMISSION
ATTN: ENVIRONMENTAL REVIEW
729 NE OREGON STREET SUITE 200
PORTLAND OR 97232

UPPER COLUMBIA UNITED TRIBES
ATTN: ENVIRONMENTAL REVIEW
PO BOX 100
WELLPOINT WA 99040

POINT NO POINT TREATY COUNCIL
ATTN: ENVIRONMENTAL REVIEW
7999 NORTHEAST SALISH LANE
KINGSTON WA 98346

SKAGIT SYSTEM COOPERATIVE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 368
LA CONNER WA 98257

CHEHALIS TRIBE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 536
OAKVILLE WA 98586

COLVILLE CONFEDERATED TRIBES
ATTN: ENVIRONMENTAL REVIEW
PO BOX 150
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COWLITZ INDIAN NATION
PO BOX 2547
LONGVIEW WA 98632

HOH TRIBAL FISHERIES
ATTN: ENVIRONMENTAL REVIEW
2464 LOWER HOH RD
FORKS WA 98331

JAMESTOWN S'KLALLAM TRIBES
ATTN: ENVIRONMENTAL REVIEW
1033 OLD BLYN HIGHWAY
SEQUIM WA 98382

KALISPELL TRIBE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 39
USK WA 99180

LOWER ELWHA KLALLAM TRIBE
ATTN: ENVIRONMENTAL REVIEW
1666 LOWER ELWHA ROAD
PORT ANGELES WA 98362-0298

LUMMI TRIBE NATURAL RESOURCES
ATTN: ENVIRONMENTAL REVIEW
2616 KWINA ROAD
BELLINGHAM WA 98226-9298

MAKAH TRIBAL COUNCIL
ATTN: ENVIRONMENTAL REVIEW
PO BOX 115
NEAH BAY WA 98357

MUCKLESHOOT TRIBAL FISHERIES
ATTN: ENVIRONMENTAL REVIEW
39015 - 172ND AVENUE SE
AUBURN WA 98002

NISQUALLY TRIBE
ATTN: ENVIRONMENTAL REVIEW
4820 SHE-NAH-NUM DRIVE SE
OLYMPIA WA 98513

NOOKSACK TRIBE
ATTN: ENVIRONMENTAL REVIEW
5048 OLD DEMING ROAD
PO BOX 157
DEMING WA 98244

PORT GAMBLE S'KLALLAM TRIBE
ATTN: ENVIRONMENTAL REVIEW
31974 LITTLE BOSTON RD NE
KINGSTON WA 98346

PUYALLUP TRIBE OF INDIANS
ATTN: ENVIRONMENTAL REVIEW
2002 EAST 28TH STREET
TACOMA WA 98404

QUILEUTE TRIBE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 279
LA PUSH WA 98350

QUINULT INDIAN NATION
ATTN: ENVIRONMENTAL REVIEW
PO BOX 189
TAHOLAH WA 98587

SAUK-SUIATTLE TRIBE
ATTN: ENVIRONMENTAL REVIEW
5318 CHIEF BROWN LANE
DARRINGTON WA 98241

SHOALWATER BAY TRIBE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 130
TOKELAND WA 98590

SKOKOMISH TRIBE
ATTN: ENVIRONMENTAL REVIEW
N. 541 TRIBAL CENTER ROAD
SHELTON WA 98584

SNOQUALMIE TRIBE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 280
CARNATION WA 98014

SPOKANE TRIBE
ATTN: ENVIRONMENTAL REVIEW
PO BOX 100
WELLPOINT WA 99040

SQUAXIN ISLAND TRIBE
ATTN: ENVIRONMENTAL REVIEW
SE 70 SQUAXIN LANE
SHELTON WA 98584

STILLAGUAMISH TRIBE
ATTN: ENVIRONMENTAL REVIEW
3439 STOLUCKQUAMISH LANE
ARLINGTON WA 9822

SUQUAMISH TRIBE
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PO BOX 498
SUQUAMISH WA 98392

SWINOMISH TRIBE
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LA CONNER WA 98257

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3901 TOTEM BEACH ROAD
MARYSVILLE WA 98270-9694

CONFEDERATED TRIBES OF THE UMATILLA
RESERVATION
TRIBAL FISHERIES PROGRAM
PO BOX 638
PENDELTON OR 97801

UPPER SKAGIT TRIBE
ATTN: ENVIRONMENTAL REVIEW
25944 COMMUNITY PLAZA
SEDRO WOOLEY WA 98284

YAKAMA INDIAN NATION
ATTN: ENVIRONMENTAL REVIEW
PO BOX 151
TOPPENISH WA 98948

1000 FRIENDS OF WA
766 THOMAS ST
SEATTLE WA 98109-5113

ADOPT A STREAM FOUNDATION
P O BOX 5558
EVERETT WA 98204

AMERICAN RIVERS
150 NICKERSON ST
SEATTLE, WA 98105

CAMAS-WASHOUGAL WILDLIFE
3617 SE WASHOUGAL RIVER ROAD
WASHOUGAL, WA 98671

CENTER FOR WILDLIFE CONSERVATION
P O BOX 31665
SEATTLE WA 98103-1665

CHEHALIS RIVER COUNCIL
PO BOX 586
OAKVILLE, WA 98568

CLARK COUNTY
NATURAL RESOURCES COUNCIL
1701 BROADWAY, SUITE 231
VANCOUVER, WA 98663

CLEAN SOUND COOPERATIVE INC.
1105 13TH STREET, SUITE 100
EVERETT, WA 98201-1679

COUGAR RIDGE WILDLIFE
EDUCATION CENTER
P.O. BOX 1179
BELFAIR, WA 98528

COWICHE CANYON CONSERVANCY
P.O. BOX 2201
YAKIMA, WA 98907

DEFENDERS OF WILDLIFE
NW REGIONAL OFFICE
1637 LAUREL ST.
LAKE OSWEGO, or 97034

EARTH SHARE OF WASHINGTON
1402 - 3RD AVE SUITE 825
SEATTLE WA 98101

EARTHCARE NW
EDITOR
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FARMERS FOR PRESERVATION OF WILDLIFE
ROUTE 1, BOX 37
ROSALIA, WA 99170

FRIENDS OF COLUMBIA GORGE
522 SW 5TH AVE SUITE 820
PORTLAND, OR 97204-2125

FRIENDS OF THE COWLITZ
1757 NATIONAL AVE N
CENTRALIA, WA 98532-2314

FRIENDS OF THE LOOMIS FOREST
790 NORTH PINE CREEK
TONASKET WA 98855

FRIENDS OF MCNEIL ISLAND
3711 W TILDEN STREET
SEATTLE, WA 98199

GIFFORD PINCHOT TASK FORCE
537 19TH AVENUE
LONGVIEW, WA 98632

GREAT BEAR FOUNDATION
4618 FREMOND N APT 104
SEATTLE WA 98103

NORTHWEST ECO SYSTEMS ALIANCE
1421 CORNWALL AVE #201
BELLINGHAM, WA 98225

GREENPEACE
ATTN: ENVIRONMENTAL REVIEW
4649 SUNNYSIDE AVE N, 5TH FLOOR
SEATTLE, WA 98103

INLAND EMPIRE PUBLIC LANDS COUNCIL
P.O. BOX 2174
SPOKANE, WA 99210-2174

INLAND EMPIRE ZOOLOGICAL SOCIETY
E. 12600 EUCLID
SPOKANE, WA 99216

INLAND NORTHWEST WILDLIFE COUNCIL
6116 N MARKET
SPOKANE, WA 99207

THE IZAAK WALTON LEAGUE
3509 NORTH 8TH
TACOMA, WA 98406

MOUNT SAINT HELENS
PROTECTIVE ASSOCIATION
2858 ROSE VALLEY LOOP
KELSO, WA 98626

THE MOUNTAINEERS
CONSERVATION DIVISION
300 THIRD AVE WEST
SEATTLE WA 98119

NAKITA NORTHWEST
120 PROSPECT
BELLINGHAM WA 98225

NATIVE FISH SOCIETY
P.O. BOX 19570
PORTLAND, OR 97280-0570

NATIVE PLANT SOCIETY
6521 ALPINE DR SW
OLYMPIA WA 98512

THE NATURE CONSERVANCY
217 PINE ST SUITE 1100
SEATTLE WA 98101

NORTHWEST FUND FOR ENVIRONMENT
1424 4TH AVE, ROOM 813
SEATTLE, WA 98101

NORTHWEST RAPTOR CENTER
P O BOX 11
CLALLAM BAY WA 98326

NW RENEWABLE RESOURCES CTR.
1411 - 4TH AVE SUITE 1510
SEATTLE WA 98101-2216

NORTHWEST TREK
GENERAL CURATOR
11610 TREK DR EAST
EATONVILLE WA 98328

OKANOGAN WILDLIFE COUNCIL
P.O. BOX 133
OKANOGAN WA 98840

OLYMPIC ENVIRONMENTAL COUNCIL
P.O. BOX 1906
PORT TOWNSEND, WA 98368

OLYMPIC ENVIRONMENTAL COUNCIL
PO BOX 1906
PORT TOWNSEND, WA 98368

OLYMPIC WILDLIFE RESCUE CENTER
54 MOX CHEHALIS RD
MCCLEARY WA 98557

PAWS
P.O. BOX 1037
LYNWOOD, WA 98036

PROTECT THE PENINSULA'S FUTURE
P.O. BOX 1677
SEQUIM, WA 98382

RAILS TO TRAILS CONSERVANCY
P.O. BOX G
TENINO, WA 98589-0210

RESOURCES NORTHWEST
PO BOX 675
KIRKLAND, WA 98034

RIVERS COUNCIL OF WASHINGTON
509 10th AVENUE EAST
SEATTLE, WA 98102-5004

SAINT HELENS HIKING CLUB
P.O. BOX 843
LONGVIEW, WA 98632

SIERRA CLUB
CASCADE CHAPTER
1516 MELROSE AVE.
SEATTLE WA 98122

SIERRA CLUB
SPOKANE CHAPTER
N 5308 OAK
SPOKANE, WA 99208

SIERRA CLUB
TWANOH GROUP
2120 N. CALLOW AVE.
BREMERTON WA 98312-2908

SIERRA CLUB
NO AMERICAN PARAGLIDING
20124 SE 146TH ST
RENTON WA 98059

SNAKE LAKE NATURE CENTER
1919 SOUTH TYLER
TACOMA, WA 98466

SNAKE RIVER PRESERVATION COUNCIL
421 SEVENTH AVENUE
LEWISTON, ID 83501

TROUT HABITAT SPECIALISTS
ATTN: RAY WHITE
320 12TH AVE N
EDMONDS, WA 98020

TRUST FOR PUBLIC LAND
1011 WESTERN AVE
SEATTLE WA 98104

URBAN WILDLIFE COALITION
935 KIRKLAND AVE
KIRKLAND, WA 98033

VANCOUVER WILDLIFE LEAGUE
P.O. BOX 1662
VANCOUVER, WA 98663

WA ENVIRONMENTAL COUNCIL
615 2ND AVE #380
SEATTLE WA 98104

WASHINGTON TOXICS COALITION
4649 SUNNYSIDE AVE N #540 EAST
SEATTLE, WA 98103

WASHINGTON TRAILS ASSOCIATION
1305 FOURTH AVE, SUITE 512
SEATTLE, WA 98101

WASHINGTON TROUT
ATTN: KURT BEARDSLEE
P.O. BOX 402
DUVALL, WA 98019

WA WILDERNESS COALITION
ATTN: ENVIRONMENTAL REVIEW
4649 SUNNYSIDE AVE N, SUITE 242
SEATTLE, WA 98103

WA WILDLIFE AND RECREATION
4001 SW CLOVERDALE
SEATTLE WA 98136

WASHINGTON WILDLIFE FEDERATION
ATTN: ED FORSLOF
P.O. BOX 1966
OLYMPIA, WA 98507-1966

WASHINGTON WILDLIFE HERITAGE
32610 PACIFIC HIGHWAY SOUTH
FEDERAL WAY, WA 98003

WASHINGTON WILDLIFE REHABILITATOR
17317 FALES ROAD
SNOHOMISH, WA 98290

WA WILDLIFE STUDY COUNCIL
6315 NE 196TH
SEATTLE WA 98155

WILD SALMON AND TROUT ALLIANCE
ATTN: SHELLEY SPALDING-CLARK
P.O. BOX 1755
OLYMPIA, WA 98507

WILD SALMON CENTER
ATTN: PETE SOVEREL
16430 72ND AVE W
EDMONDS, WA 98026

THE WILDERNESS SOCIETY
1424 FOURTH AV, SUITE 816
SEATTLE WA 98101

WILDHAVEN WILDLIFE CENTER
11132 CALIFORNIA ST
KINGSTON, WA 98346

WILDLIFE HERITAGE FOUNDATION
32610 PACIFIC HIGHWAY SOUTH
FEDERAL WAY WA 98003

WILDLIFE SOCIETY, WA CHAPTER
7025 SANDY POINT ROAD NE
OLYMPIA, WA 98506

WOLF ACTION GROUP
P O BOX 773
BELLINGHAM WA 98227

WOLF HAVEN AMERICA
3111 OFFUT LAKE ROAD
TENINO, WA 98589

YAKIMA RIVER GREENWAY FOUNDATION
111 S 18TH ST
YAKIMA, WA 98901

CINDY MOORE
WATER QUALITY
DEPARTMENT OF AGRICULTURE
PO BOX 42589
OLYMPIA, WA 98504-2589

BARBARA MORRISSEY
OFFICE OF TOXIC SUBSTANCES
DEPARTMENT OF HEALTH
PO BOX 47825
OLYMPIA, WA 98504-7825

WENDY BROWN
AQUATIC RESOURCES DIVISION
DEPARTMENT OF NATURAL RESOURCES
PO BOX 47027
OLYMPIA, WA 98504-7775

JOAN HARDY
ASSESSMENT SERVICES
DEPARTMENT OF HEALTH
PO BOX 47846
OLYMPIA, WA 98504-7846

SKAGIT COUNTY PLANNING DEPARTMENT
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MT VERNON, WA 98273-3877

GEORGE ALLEN
SPOKANE WALLEYE CLUB
N 5828 OAK
SPOKANE, WA 99205

JOE ARBELLO
B.A.S.S.
1721 METHOW ST
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C. CLARE CRANSTON
RICHLAND ROD AND GUN CLUB
907 W NIXON
PASCO, WA 99301

BILL DE MARIS
INLAND EMPIRE BASS CLUB
PO BOX 28929
SPOKANE, WA 99228

CHARLES DUNNING
WALLEYE UNLIMITED
N 5122 ORMOND RD
OTIS ORCHARD, WA 99027

GERLAD ERIKSON
HIGH LAKERS
PO BOX 1896
SHELTON, WA 98584-5019

BRIAN HARTZELL
SPORTCO, FISHING INDUSTRY
4602 20TH ST E
FIFE, WA 98424

TOM HOAG
INLAND EMPIRE FLY FISHING CLUB
809 E CRYSTAL BAY RD
POST FALLS, ID 83854

JIM LEDBETTER
8029 - 36TH AVE NE
SEATTLE, WA 98115

MARC MARCANTONIO
AMERICAN BASS ASSOCIATION
603 KAUNTZ COURT
STEILACOOM, WA 98338

MIKE MESEBERG
MARDON RESORT
8198 HWY 262 SE
OTHELLO, WA 99344

REG MORGAN
GRANT CO RECREATION
1000 CAMAS
COULEE DAM, WA 99116

GORDON STEINMETZ
FISHING GUIDE
9944 HWY 2 E
COULEE CITY, WA 99115

BILL ORR
MID-COL. R. WALLEYE CLUB
4409 BENJAMIN
YAKIMA, WA 98908

MIKE SWAYNE
TRAIL BLAZERS
8041 171ST AVE NE
REDMOND, WA 98052

JIM OWENS
CAST FOR KIDS
296 SW 43RD ST
RENTON, WA 98055

RICHARD THOMPSON
1561 STRANDE RD
ELLENSBURG, WA 98926

JIM PRUDENTE
SILVER BOW FLY SHOP
1003 E TRENT AVE STE 140
SPOKANE, WA 99202

SKINNER WOODS
EVERGREEN FLY FISHING CLUB
2200 143RD PL NE
MARYSVILLE, WA 98271

FRED SHIOSAKI
E 10406 DEAN
SPOKANE, WA 99206

RON SAWYER
8138 SCOTT RD NE
MOSES LAKE, WA 98835

DAVID W HEISER
PARKS AND RECREATION COMM
RESOURCES DEVELOPMENT
P O BOX 42650
OLYMPIA WA 98504-2650

DANA RASMUSSEN
ENV PROTECTION AGENCY
REGION 10
1200 SIXTH AVE
SEATTLE WA 98101

GREG SORLIE
DEPT OF ECOLOGY
P O BOX 47600
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ENVIRONMENTAL COORDINATOR
DEPT OF NATURAL RESOURCES
P O BOX 47000
OLYMPIA WA 98504-7000

ENVIRONMENTAL COORDINATOR
DEPT OF ECOLOGY
ENVIRONMENTAL REVIEW
P O BOX 47600
OLYMPIA WA 98504-7600

GOVERNOR
LEGISLATIVE BUILDING
P O BOX 40002
OLYMPIA WA 98504-0002

WASHINGTON STATE LIBRARY
DOCUMENTS SECTION
P O BOX 42460
OLYMPIA WA 98504-2460

JOHN W KEYS III
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
1150 N CURTIS RD
BOISE ID 83706-1234

JOHN E LOWE
U S FOREST SERVICE
REGION 6
P O BOX 3623
PORTLAND OR 97208

COLUMBIA BASIN FISH & WILDLIFE AUTHORITY
METRO CENTER
2501 SW 1ST AVE STE 200
PORTLAND OR 97201

BERTHA SIMPSON
WA ST SPORTS COUNCIL
437 N PERCIVAL
OLYMPIA WA 98502

LINDA CATTEBAY
BONNEVILLE POWER ADMIN
905 NE 11TH
PORTLAND OR 97208

US ARMY CORP OF ENGINEERS
DISTRICT OFFICE
P O BOX 3755
SEATTLE WA 98124-2255

US FISH & WILDLIFE SERVICE
FISH & WILDLIFE ENHANCEMENT
510 DESMOND DR SE STE 102
LACEY WA 98503-1292

MARIA ZUROWSKE
THURSTON CO HEALTH DEPT
2000 LAKERIDGE DR
OLYMPIA WA 98502

JERRY OPATZ
US FISH & WILDLIFE SERVICE
1200 6TH AVE
SEATTLE WA 98101

ADOPT A STREAM FOUNDATION
600 128TH ST SE
EVERETT WA 98208-6353

SIERRA CLUB
8511 15TH NE
SEATTLE WA 98115

LAKE LAWRENCE IMPROVEMENT CLUB
16646 PLEASANT BEACH DR
LAKE LAWRENCE WA 98597

NAKE EIR QUESTER
P O BOX 224
INDIANOLA WA 98342

THE MOUNTAINEERS
CONSERVATION DIVISION
300 THIRD AVE W
SEATTLE WA 98119

IZAAK WALTON LEAGUE
3509 N 8TH
TACOMA WA 98406

LARRY MINKLER
WA WILDLIFE HERITAGE
32610 PACIFIC HWY S
FEDERAL WAY WA 98003

GREENPEACE
5018 17TH AVE NW
SEATTLE WA 98105

FRANK STRICKLIN
WA STATE SPORTS COUNCIL
8300 HIDEAWAY LN NW
SILVERDALE WA 98383-9314

NELS HANSON
WA FARM FORESTRY ASSOC
110 W 26TH
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DAN AHRENHOLTZ
WA FARM BUREAU
P O BOX 2009
OLYMPIA WA 98507-2009

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300 THIRD W
SEATTLE WA 98119

STATE AUDUBON SOCIETY
1063 CAPTIOL WAY STE 208
OLYMPIA WA 98501

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OKANOGAN CO PLANNING COMM
149 THIRD N
OKANOGAN WA 98840

PAMELA KELLEY
PEND OREILLE CO PLANNING DEPT
P O BOX 5000
NEWPORT WA 99156

CRAIG WARD
JEFFERSON CO PLANNING DEPT
P O BOX 1220
PORT TOWNSEND WA 98368

BILLIE SUMRALL
GRANT CO PLANNING COMM
P O BOX 37
EPHRATA WA 98823

TERRY GOODMAN
LINCOLN CO PLANNING COMM
RR1 BOX 368
DAVENPORT WA 99122-9801

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GRAYS HARBOR PLANNING DEPT
P O BOX 390
MONTESANO WA 98563

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SNOHOMISH CO PLANNING DEPT
3000 ROCKEFELLER AVE
EVERETT WA 98201

CRAIG LARSEN
KING CO PLANNING DEPT
510 3RD AVE #350
SEATTLE WA 98104-1622

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ADAMS CO PLANNING COMM
165 N FIRST
OTHELLO WA 99344

HAROLD ROBERTSON
THURSTON CO REG PLANNING
2000 LAKERIDGE DR SW
OLYMPIA WA 98502

DICK ANDERWALD
YAKIMA CO PLANNING DEPT
COUNTY COURTHOUSE RM 417
YAKIMA WA 98901

BRYAN HARRISON
PACIFIC CO PLANNING
P O BOX 66
SOUTH BEND WA 98588

MARK CAREY
KITITITAS CO PLANNING COMM
COUNTY COURTHOUSE RM 182
ELLENSBURG WA 98926

DONNA DEAL
GARFIELD CO BOARD OF COMMISSIONERS
P O BOX 278
POMEROY WA 99347

CRAIG GREENLEAF
CLARK CO PLANNING DEPT
P O BOX 9810
VANCOUVER WA 98668-9810

DICK GERMAN
FRANKLIN CO PLANNING DEPT
1016 FOURTH
PASCO WA 99301

DAVID HOUGH
SKAGIT CO PLANNING DEPT
120 W KINCAID ST ANNEX #2
MT VERNON WA 98273

LAURA ARNOLD
SAN JUAN CO PLANNING DEPT
P O BOX 947
FRIDAY HARBOR WA 98250

TERRY KNAPTON
FERRY CO PLANNING DEPT
P O BOX 305
REPUBLIC WA 99166

EDWARD LOIDHAMER
CHELAN CO PLANNING COMM
411 WASHINGTON ST
WENATCHEE WA 98801

KIM LYONNAIS
COLUMBIA CO PLANNING DEPT
114 S 2ND
DAYTON WA 99328

MICHAEL ZENGEL
LEWIS CO PLANNING DEPT
350 N MARKET BLVD
CHEHALIS WA 98532

HAL HART
STEVENS CO PLANNING DEPT
2515 S OAK COURTHOUSE ANNEX
COLVILLE WA 99114

GARY YANDO
MASON CO PLANNING DEPT
P O BOX 578
SHELTON WA 98584

ISLAND CO PLANNING DEPT
P O BOX 5000
COUPEVILLE WA 98239

TERRY MARDEN
BENTON CO PLANNING DEPT
P O BOX 910
PROSSER WA 99350

DON BRIGHAM
ASOTIN CO PLANNING COMM
135 SECOND ST
ASOTIN WA 99402

ELLEN WILSON
15617 LAWRENCE LAKE RD SE
YELM WA 98597

BURGESS MEREDITH
15824 LAWRENCE PL SE
YELM WA 98597

JOHN CARPENTER
P O BOX 516
YELM WA 98597

DAVE & KAREN WILSON
2513 395TH ST CT S
ROY WA 98580

JOHN HEVENER
9605 TILLEY RD
OLYMPIA WA 98501

PAMELA LYONS
3813 BISKEY ST NW #18
OLYMPIA WA 98502

ROBERT GIBSON
P O BOX 11
TENINO WA 98589

WILLIAM GRONE
5422 34TH ST LP NE
TACOMA WA 98422

BOB BOYER
P O BOX 212
TENINO WA 98589

GERRI WOLF
P O BOX 4001
TENINO WA 98589-4001

L B PRINCE
16811 17TH AVE E
SPANAWAY WA 98387

RUBY LAVON
14814 CEDARWOOD DR SE
TENINO WA 98589

ROBERT LINDLEY
16646 PLEASANT BEACH DR SE
YELM WA 98597

JOE DEPINTO
15805 WILDAIRE DR SE
YELM WA 98587

DENNIS KELLOGG
14922 CEDARWOOD DR
TENINO WA 98589

RICHARD GOODWIN
1021 H ST
CENTRALIA WA 98531

DEL HINZPETER
16404-A TILLEY RD S
TENINO WA 98589

ERIC STEWART
12909 SILVER CR DR
TENINO WA 98589

DOUG VASSAR
P O BOX 15
TENINO WA 98589

MARION KLING
8800 NE OHMAN RD
KINGSTON WA 98346

RICHARD RICH
16648 PLEASANT BEACH RD SE
YELM WA 98597

JOE SOKOLIK
530 SAWYER SE
OLYMPIA WA 98502

PETE STEWART
12909 SILVER CR RD SE
TENINO WA 98589

TED HABERMEN
14846 CEDARWOOD RD
TENINO WA 98589

CHUCK FLORY
15908 LAWRENCE PL SE
YELM WA 98597

BILL CLELAND
15002 MILITARY RD
TENINO WA 98589

PAUL SCHNEIDER
1411 HUBBARD RD
YAKIMA WA 98903

JOHN KELLY
1612 SE 166TH
SEATTLE WA 98166

ROD MESEBERG
800 OSULLIVAN DAM RD
OTHELLO WA 99344

DICK THOMPSON
10104 NW 4TH AVE
VANCOUVER WA 98686

WILLIAM BARNETT
305 CHATHAM HILL RD
WENATCHEE WA 98801

FRANK HAW
3811 15TH COURT NE
OLYMPIA WA 98502

RAY LEBSACK
N 3505 VISTA RD
SPOKANE WA 99212

RON TINGLEY
1024 RIDGE PL
SEDRO WOOLLEY WA 98284

BILL MCMILLIAN
MPO 25 R
LAUREL LANE S
WASHOUGAL WA 98671

AL SUSSEE
1807 E 72ND ST
TACOMA WA 98404

PATRICK TROTTER
4926 26TH AVE S
SEATTLE WA 98108

JOE JAQUET
1121 W JACKSON
OLYMPIA WA 98502

SPOKANE REVIEW CHRONICLE
W 999 RIVERSIDE
SPOKANE WA 99204

THE SEATTLE TIMES
P O BOX 70
SEATTLE WA 98111

THE JOURNAL AMERICAN
P O BOX 310
BELLEVUE WA 98009

THE TACOMA NEWS TRIBUNE
P O BOX 11000
TACOMA WA 98411

THE COLUMBIA BASIN DAILY HERALD
P O BOX 910
MOSES LAKE WA 98837

THE EVERETT HERALD
P O BOX 930
EVERETT WA 98206

THE OMAK CHRONICLE
P O BOX 553
OMAK WA 98841

THE SPOKESMAN REVIEW
P O BOX 2160
SPOKANE WA 99210

THE JOURNAL TIMES
P O BOX 288
RITZVILLE WA 99169

JIM OWENS
BASS ANGLERS SPORTSMAN'S SOCIETY
16569 162ND PL SE
RENTON WA 98058

DAN PFEIFFER
BASS ANGLERS SPORTSMAN'S SOCIETY
4243 E 29TH AVE
SPOKANE WA 99223

CHUCK DUNNING
WALLEYES UNLIMITED
N 5122 ORMOND RD
OTIS ORCHARDS WA 99027

GEORGE ORR
SPOKANE WALLEYE CLUB
E 11411 29TH AVE
SPOKANE WA 99206

COALITION OF SPORTS FISHERMEN
1719 N OAKES
TACOMA WA 98406

BILL ROBINSON
TROUT UNLIMITED
2401 BRISTOL CT A-18
OLYMPIA WA 98502

WA FLY FISHING CLUB
P O BOX 639
MERCER ISLAND WA 98040

KEITH GROTY
FEDERATION OF FLY FISHERS
3496 JOSEPHINE LN
MASON MI 48854

CARL SOUTHARD
20100 44TH DR NE
ARLINGTON, WA 98223-4723

MARION MCCASLAND
INLAND EMPIRE BASS CLUB
W 2527 LACROSSE
SPOKANE WA 99205

INLAND EMPIRE FLY FISHING CLUB
BOX 2926 TERMINAL ANNEX
SPOKANE WA 99205

BOB HEIRMAN
SNOHOMISH CO SPORTSMEN
1920 LAKE ST
SNOHOMISH WA 98920

LARRY GOODROW
UPPER COLUMBIA UNITED TRIBES
P O BOX 100
WELLPINIT WA 99040

VIVIAN LEE
HOH INDIAN TRIBE
2464 LOWER HOH RD
FORKS WA 98331

HUBERT MARKISHTUM
MAKAH INDIAN TRIBE
P O BOX 115
NEAH BAY WA 98357

POINT NO POINT TREATY COUNCIL
7850 NE LITTLE BOSTON RD
KINGSTON WA 98346

JOSEPH PAVEL
SKOKOMISH INDIAN TRIBE
N 80 TRIBAL CENTER RD
SHELTON WA 98584

DOUGLAS WOODRUFF
QUILEUTE INDIAN TRIBE
P O BOX 279
LA PUSH WA 98350

HENRY CAGEY
LUMMI INDIAN TRIBE
2616 KWINA RD
BELLINGHAM WA 98226-9298

HUBERT WILLIAMS
NOOKSACK INDIAN TRIBE
P O BOX 157
DEMING WA 98244

PEARL COPEMAN BALLER
QUINULT INDIAN NATION
P O BOX 189
TAHOLAH WA 98587

EMERSON GEORGE
SUQUAMISH INDIAN TRIBE
P O BOX 498
SUQUAMISH WA 98392

EDDIE PALMANTEER JR
COLVILLE CONFEDERATED TRIBES
P O BOX 150
NESPELEM WA 99155

COLUMBIA RIVER INTER TRIBAL FISHERIES
COMMISSION
729 NE OREGON ST STE 200
PORTLAND OR 97232

W RON ALLEN
JAMESTOWN S'KALLAM TRIBE
1033 OLD BLYN HWY
SEQUIM WA 98382

DORIAN SANCHEZ
NISQUALLY INDIAN TRIBE
4820 SHE NAH NUM DR SE
OLYMPIA WA 98513

GERALD JONES
PORT GAMBLE INDIAN TRIBE
31912 LITTLE BOSTON RD NE
KINGSTON WA 98346

GARY GRAVES
NWIFC
6730 MARTIN WAY E
OLYMPIA WA 98506

STEVEN FANSEN
SKAGIT SYSTEM COOPERATIVE
P O BOX 368
LACONNER WA 98257

LAWRENCE JOSEPH
SAUK SUIATTLE INDIAN TRIBE
5318 CHIEF BROWN LANE
DARRINGTON WA 98241

ROBERTA YOUNG
PUYALLUP INDIAN TRIBE
2002 E 28TH ST
TACOMA WA 98404

STAN JONES SR
TULALIP INDIAN TRIBE
6700 TOTEM BEACH RD
MARYSVILLE WA 98270-9694

GAIL GREGER
STILLAGUAMISH INDIAN TRIBE
3439 STOLUCKQUAMISH LN
ARLINGTON WA 98223

VIRGINIA CROSS
MUCKLESHOOT INDIAN TRIBE
39015 172ND AVE NE
AUBURN WA 98002

BRUCE WYNNE
SPOKANE INDIAN TRIBE
P O BOX 100
WELLPINIT WA 99040

DAVID LOPEMAN
SQUAXIN ISLAND TRIBE
SE 70 SQUAXIN LANE
SHELTON WA 98584

JERRY MENINICK
YAKAMA INDIAN NATION
P O BOX 151
TOPPENISH WA 98948

GARY REEVES
1514 CASTLEROCK ST
WENATCHEE WA 98801

LIBERTY LAKE SEWER DIST
S 1827 LIBERTY LAKE DR
LIBERTY LAKE WA 99019

BEN SCHROETER
2823 34TH AVE W.
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JIM MOORE
32465 MOORE RD. NE
COULEE CITY, WA 99115

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7628 E. WOODVIEW CT.
SPOKANE, WA

JERRY MCBRIDE
4653B E. DEER LAKE RD.
LOON LAKE, WA 99148

WAYNE MERIDITH
21723 N. MEADOWVIEW CT.
COLBERT, WA 99005

DON SWEENEY
9417 S. FREEMAN DR.
MEDICAL LAKE, WA 99022

ROSS HESSELTINE
14418 N. DAKOTA
SPOKANE, WA 99208

STEVEN DIXON
13416 N. CALISPEL CT.
SPOKANE, WA 99208

JIM BERRY
6605 N. STEVENS
SPOKANE, WA 99208

ROBERT BATES
2709 W. DELL DR.
SPOKANE, WA 99208

BRUCE, ANDERSON
5111 N. 14TH ST.
TACOMA, WA 98406

LORAN KOLLMORGAN
14306 23RD AVE. SW
BURIEN, WA 98166

NORMAN S. LAVIGNE
1999 BLACK LAKE RD.
COLVILLE, WA 99114

NANCY WELLER
4601 W MONROE
SPOKANE, WA 99205

REVISED ON 10/15/01



State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Habitat Program: 600 Capitol Way N, Olympia, Washington 98501-1091 - (360) 902-2534

**DETERMINATION OF SIGNIFICANCE
AND REQUEST FOR COMMENTS ON SCOPE OF SUPPLEMENTAL EIS**

**Public comment on the scope of issues in the Non Project
Review Form and Determination of Significance will be
accepted from June 15 until July 13, 2001**

Description of Proposal: Update the 1992 Supplemental Environmental Impact Statement (SEIS) to incorporate new information as required by WAC 197-11-405(4). Since the 1992 SEIS additional information has been presented concerning Rotenone use and health issues. The objectives of the scope of the SEIS are to:

1. Review any new information on human health issues that may indicate a change of policy concerning how rotenone is used.
2. Provide policy and a framework for safe application of rotenone.
3. Provide a policy that will address health concerns of inert ingredients often used with rotenone.
4. Provide a policy and framework to protect both groundwater and the public if rotenone is used.

Proponent: Washington Department of Fish and Wildlife

Location of Proposal, including street, if any: In lakes throughout the state where fishing opportunities can occur or in lakes and streams where the need exists to remove exotic fish species in order to restore native fish populations.

Lead Agency: Washington Department of Fish and Wildlife

EIS Required. Washington Department of Fish and Wildlife (WDFW) has determined that some elements of the alternatives considered may have a significant adverse impact on the environment. In addition, WDFW believes a Supplemental Environmental Impact Statement (SEIS) may provide information useful in future decision making. As a result, WDFW will prepare a SEIS [RCW 43.21C.030(2)(c)]. An experimental Non-Project Review Form is being used as an analysis tool (See related documents and additional information section.)

The lead agency had identified the following areas for discussion in the EIS:

1. Inerts used to apply Rotenone to aquatic areas. Discussion will include application of both powder and liquid rotenone formulas.
2. Swimming in waters that have recently been treated with Rotenone. Ingestion of rotenone treated water will be discussed, including powder and liquid. Skin irritation and potential ingestion will be discussed.
3. Long-term effects from contact with Rotenone applied to aquatic areas. Diseases that may be potentially caused from Rotenone will be explored.
4. Groundwater. The document will discuss the effects, if any, Rotenone might have on groundwater when applied to lakes and streams.

Scoping. Agencies, affected tribes and members of the public are invited to comment on the scope of the SEIS. You may comment on alternatives, mitigation measures, probable impacts, and permits or other approvals that may be required. The method and deadline for giving us your comments is:

Written comments should be received at the address listed below no later than
July 13, 2001.

Please return your scoping comments, with this page, to the address shown below. If you have questions about the project, please contact Jim Uehara, Project Leader, Fish Program, at 360-902-2738.

If you have questions on the scoping process please contact the SEPA Coordinator, Cynthia Pratt, at 360-902-2575 or e-mail prattcrp@dfw.wa.gov.

Responsible Official: Peter Birch

Position/Title: Environmental Services Division Manager

Address: 600 Capitol Way North, Olympia, WA 98501

DATE OF ISSUE: June 15, 2001 **SIGNATURE:**  for Peter Birch

Public Meetings will be held at the following sites and dates:

June 26, 7 PM - 9 PM Seattle Area Public Scoping Meeting

Doubletree Hotel Seattle Airport
18740 Pacific Highway S.
Seattle, Washington

(Located on the corner of 188th and Pacific Highway S., near Seatac Airport)

June 28, 7 PM - 9 PM Spokane Public Scoping Meeting

North Spokane County Library

44 E. Hawthorn Rd.

Spokane, Washington

(Located in North Spokane, 1 block east of State Highway 395 on Hawthorn Rd. and Colfax St. Access to the library parking lot is off of Colfax St.)

Request for Environmental Documents for:

Scoping for Lake and Stream Rehabilitation SEIS, and Non-Project Review Form.

Send to:

Cynthia Pratt, SEPA/NEPA Coordinator, 600 Capitol Way N, Olympia, WA 98501-1091
or access WDFW's SEPA website at <http://www.wa.gov/wdfw/hab/sepa/sepa.htm>

If you would like your name removed from our distribution list, please contact Terri Mielke at 902-2550 or by e-mail at mielktmm@dfw.wa.gov

Related Documents and Additional Information:

A copy of the 1992 Supplemental EIS may be reviewed through the Washington State Library, Department of Ecology's Environmental Review Section, or through the Washington Department of Fish and Wildlife's Fish Program. There are additional Addendums that have been prepared annually that have identified what lakes were to be treated during the coming season. A copy of these can be obtained from the Washington Department of Fish and Wildlife, Habitat Program, Attention: SEPA/NEPA Coordinator, 600 Capitol Way North, Olympia, Washington 98501-1091.

SUMMARY

The following document is an experimental Non-Project Form Ecology is testing to streamline environmental analysis for non-project State Environmental Policy Act actions. It is part of SEPA Scoping, so it may appear to be incomplete, but one of the functions of scoping is to identify factors to be analyzed. Therefore, based on comments received during Scoping and as a result of additional environmental analysis, we are anticipating a more detailed document to be submitted as a Supplemental EIS. We are especially interested in commenter's views on issues, objectives, alternatives, and areas of concern.

This document is intended to supplement the Lake and Stream Rehabilitation Program as reviewed under the 1992 Final SEIS. The program's decisions will be submitted to the Fish and Wildlife Commission based on alternatives chosen from the proposed SEIS once it is final.

Scoping and environmental analysis may identify potential changes needed to the Lake and Stream Rehabilitation Program based on analysis of the health issues as outlined in this Scoping Notice. Commenters are invited to provide their views on needed changes. The Non-Project Review Form will be updated as more information becomes available.

Below is the Non-Project Review Form. Because WDFW is in the initial planning stages, and Scoping has just begun, not all questions have been answered. Other answers may be changed or expanded as the project proceeds.

State Environmental Policy Act (SEPA)

Non-Project Review Form (NPRF)

Fundamental premises

1. The environmental analysis and the proposal development process should be integrated and run concurrently
2. Governmental actions under SEPA cause environmental impacts by directing, encouraging or enabling physical changes that result in such impacts.
3. In the development of a proposal preliminary decision are made that set the direction and may have environmental consequences.
4. Analysis of impacts and alternatives of key issues throughout the proposal development process will more likely result in a proposal that better reflects environmental values.

General

The non-project review form is designed to be used concurrently with the development of a non-project proposal. To achieve maximum effectiveness and efficiency the initial use of the form should begin at the same time as a non-project is being contemplated, i.e. upon identification that a plan, policy or rule is likely to be needed or is mandated.

–Iterative process: The form is designed so that as a proposal is developed, the form is updated and detail is added. When a complete draft proposal is ready for public review, or review by an intermediary governmental body (e.g., a planning commission), the form should be at a comparable draft state, similar to a draft environmental impact statement (DEIS).

–Initial completion of form: All questions and requests for information should be reviewed when a non-project proposal is contemplated, recognizing that at this stage, it is premature to respond to some questions and some of the answers will change as the proposal is developed. Generally, at the initial stages, NPRF Sections 1) and 2) can be fully completed and the first several questions in the remainder of the sections can be preliminarily answered.

Those questions that are italicized and underlined are to be completed after the development of a proposal or preferred alternative



(June 13, 2001 version, DRAFT 5)

NONPROJECT REVIEW FORM

1) Background

a) Agency and contact name, address, telephone, fax, email

Washington Department of Fish and Wildlife
Jim Uehara
Fish Management Division
600 Capitol Way N.
Olympia, Washington 98501-1091
(360) 902-2738
FAX: (360) 902-2944
email: ueharjku@dfw.wa.gov

b) Designated responsible official

Peter Birch, Habitat Program, Washington Department of Fish and Wildlife

c) Name of proposal, if any, **and brief description**

The Washington Department of Fish and Wildlife (WDFW) proposes to update the WDFW Final Supplemental Environmental Impact Statement (FSEIS), Lakes and Streams Rehabilitation using rotenone 1992. New information about rotenone has been developed since 1992 and the department proposes to review this information on potential effects to the environment and human health and update the FSEIS based on this review.

Guidance #1(d): This response should name the jurisdictional coverage and that portion of the jurisdiction where the nonproject action will apply. Example, the nonproject action will apply statewide to all areas designated as being under the jurisdiction of the Shoreline Management Act. This includes all lakes over 20 acres, all streams with an annual mean flow of 20cfs and all saltwater areas, plus 200 feet from ordinary high water marks any associated wetlands.

d) Describe the jurisdiction or area where the proposal is applicable.

1. Statewide, in lakes where fishing opportunities can occur.
2. Lakes and streams where the need exists to remove exotic fish species for rehabilitating and recovering native fish populations or other native aquatic communities.

Guidance #1(e): Briefly describe the law, ordinance, chapter, etc. that allows the lead agency to undertake and approve the anticipated action, or cite relevant language. Example, Chapter XXX RCW states: The Department of Ecology is authorized and directed to promulgate regulations to carry out the provisions of this act.

e) What is the legal authority or mandate for the proposal?

RCW 77.04.012 mandates the Department of Fish and Wildlife to preserve, protect, perpetuate, and manage game fish in state waters and to enhance and improve recreational fishing.

RCW 77.12.420 empowers the Fish and Wildlife Commission to authorize the eradication of undesirable fish for the improvement of conditions for growth of game fish.

The Commission's right to rehabilitate lakes and streams was affirmed by Thurston-Mason County Superior Court in the case of Patrick vs. Biggs (#27476), January, 1954.

2) Need and Objectives

Guidance #2(a): This response should address both the immediate problem and, if appropriate, how it relates to a broader need. Example, the problem may be to provide additional low income housing while the need is to provide suitable housing for all income levels within the jurisdictions.

a) Describe the problem to be addressed and the need for the action.

New issues concerning environmental effects and human health resulting from rotenone have become apparent since the 1992 FSEIS on Lake and Stream Rehabilitation was issued. This new information on rotenone and these issues need to be reviewed and acceptable alternatives developed for continued rotenone use.

Guidance #2(b): Response reflects the specific objectives that the nonproject action will try to achieve. Example, the objection is to provide suitable low-income housing for 200 families.

b) Describe the primary objective(s) of the proposal.

The primary objective of this proposal is to evaluate human health concerns. This will update the 1992 FSEIS on rotenone use for Lake and Stream Rehabilitation with information new since the FSEIS was issued.

c) Are there any other objectives? If so, describe.

Addressing these concerns will allow the program to continue in a safe, environmentally conscious manner.

Guidance #2(d): This question is placed early in the form to stimulate thought and assist in identifying key issues that may arise later in the process. It also provides an opportunity for the public and others to identify concerns that they may have.

d) What are the current known or anticipated key environmental issues or areas of controversy or concern?

There is concern that: 1. The inert ingredients found in the liquid formulations of rotenone products may adversely affect water quality and the environment. 2. There may be newly discovered effects to human health from rotenone.

Guidance #3: Lead agencies are encouraged to identify and use previous environmental documents to avoid duplication. Therefore, the response should be specific both as to the documents (SEPA and/or NEPA) covering the topic and those impacts that have been adequately analyzed.

3) Previous Documentation

a) Identify and briefly describe any similar or related plan, regulation, policy, etc. currently in effect governing this geographic area and that contains the means to further the primary objective.

FSEIS Lake and Stream Rehabilitation, 1992 and annual addendums. The annual addendums identify what lakes will be treated during the coming season

WDFW Fish and Wildlife Commission Policy Number POL-C3010. This policy states that manipulation of aquatic ecosystems using chemical piscicides is a valuable tool and a cost effective management tool for providing quality fishing opportunities in many waters of the state.

b) Is this proposal likely to result in an amendment to or replacement of such existing regulation, policy or plan? Briefly describe.

This proposal will likely result in an amendment to update and address areas not adequately analyzed in FSEIS Lake and Stream Rehabilitation 1992.

c) List any environmental documents (SEPA or NEPA) that have been prepared for items identified in 3a above. Identify the type of document, lead agency, and issue date.

FSEIS Lake and Stream Rehabilitation 1992 and annual addendums for 1993 through 2000 are currently in effect.

The U.S. Fish and Wildlife Service provides funding for the purchase of rotenone and provides a Programmatic Environmental Assessment under NEPA for Funding Rotenone Projects through the Federal Aid in Sport Fish and Wildlife Restoration Programs.

d) Do the SEPA documents in 3c adequately analyze any or all of the impacts from the alternatives being considered? **(Impacts with previous adequate analysis need not be re-analyzed, but should be incorporated by reference into the NPRF.)**

No. While human health impacts were analyzed in 1992, new information since then needs to be reviewed.

Guidance #4: Many legal authorizations offer flexibility in how the policy may be achieved. Example, a law may authorize or direct the promulgation of rules, but it may be within an agency's prerogative to accomplish certain objectives through a nonregulatory approach such as guidance or educational/outreach.

4) Alternative Approaches

a) Briefly describe any legal or other mandate that requires a particular approach?

b) If there is no mandated approach, what type of approaches could reasonably achieve the objectives?

c) *Why was the approach presented in the proposal selected?*

This will be filled out as planning proceeds.

Guidance #5: The responses to these questions may be expected to change with various iteration, as new stakeholders are identified, the proposed actions becomes better defined and public awareness is increased.

5) Public, Agency and Tribal Involvement

a) Who are the known primary stakeholders?

The angling public, Environmental groups, lakeshore property owners, Washington Department of Ecology, U.S. Fish and Wildlife Service.

b) What other jurisdictions are involved and for what reason?

The Washington Department of Ecology for temporary water quality variances and NPDES permits.

c) What types of processes will be used for soliciting, evaluating, and documenting input from stakeholders, agencies, tribes and the public?

Public notices, and notices of meetings and hearings through the department web site and current mailing lists. The current distribution list is enclosed.

d) If different from above, briefly describe the processes used in addressing the public's and other interested parties concerns and comments?

Guidance #6: This response should describe those attributes of the area(s) likely to be affected by "on the ground" activities. The specificity will vary depending on both the nature of the anticipated nonproject action as well as the jurisdictional constraints. A nonproject action covering all contaminated sites should broadly describe whether or not most or many sites are in urban areas, near water bodies, in industrially developed areas, etc. A nonproject action for a one hundred-acre region will contain considerably greater detail to the degree that the reader can visualize the area.

6) Existing Environment

a) Generally describe the existing environmental landscapes (i.e., status or quality of ecosystem) likely to be affected if the proposal is implemented. Include a description of the existing environment where resulting "on the ground" activities may occur and adjacent areas and facilities likely to be impacted. The following should be included, as appropriate:

- Primary physical features
- Development level and infrastructure
- Percent impervious surfaces (approximate)
- Unique features, including historic and cultural sites, potential or existing critical areas, resource lands
- Endangered or Threatened Species in or near the area

Approximately 200 lakes and ponds in Washington. WDFW Fish and Wildlife Commission policy POL-C3010 specifically states that: waters will not be treated in ways which would cause significant negative impacts to fish or wildlife which are state or federally listed as Threatened, Endangered, Sensitive or Candidate Species.

A more thorough discussion will be developed as the document is prepared.

7) Broad Impacts

a) In meeting the primary objective (identified in 2b of this form) is it likely that the non-project action will direct an agency to develop or construct projects? Describe.

Yes. Projects will be initiated that will reduce unwanted fish in various lakes throughout the state.

b) In meeting the primary objective is it likely that the non-project action will encourage physical changes to the natural or built environment? Describe.

Perhaps. If recreational fisheries become more productive, it may encourage some people to move to these areas for better access to fishing.

c) What is the location (geographic area) where changes will be directed or encouraged? Include the area directly affected, as well as adjacent or other areas where changes will be indirectly encouraged.

Lakes, ponds and streams statewide. Lakes that are potable water sources will not be affected.

d) Will this action constrain certain activities or development, but not preclude all activities or developments? Briefly describe.

This action should not constrain activities or development past the initial period of application of rotenone.

Guidance #8: In the development of a nonproject proposal, preliminary decisions are made as to what direction or alternatives will best meet the objective(s). This section documents those issues, analyze the environmental consequences, and describes alternatives (particular to those with lessor adverse environmental impacts). For the selected preliminary decision, mitigation should be reviewed as to whether or not it is consistent with the objective(s). Documentation of the rationale such as, economics or constrained by existing law, for not considering other alternatives should be provided.

8) Key issues/questions, alternatives, impacts and mitigation.

This will be filled out after scoping.

a) Identify key issue/question # 1. Include a brief statement of why this is a key issue/question.

b) Identify alternative solutions.

(1) How would each alternative solution likely direct, encourage or enable:

- New Development?
- Redevelopment?
- Changes in land use?
- Changes in density of use?
- Changes in management practices?

(2) What are the likely impacts from the changes?

(3) What are potential mitigation measures for these impacts?

(4) Will the intent of the proposal still be met if these impacts occur?

c) What preliminary decision, if any, was made regarding this key issue?

d) Which alternatives will be carried forward for further analysis?

e) For those alternatives not carried forward please describe why not?

f) Key issue/question #2, 3,.....Repeat above questions for each key issue.

Definition: Key issues/questions are those for which the solution may limit the

range of alternatives or commit the agency to take a particular direction and that could have adverse impacts to the environment.

Key issues and questions have been very thoroughly covered in the 1992 FSEIS except for newly emergent questions and information concerning public safety resulting from rotenone applications. These will be explored after Scoping has been completed.

THE REMAINDER OF THIS FORM IS EXPECTED TO BE FILLED OUT AND COMPLETED AT THE FINAL STAGES OF THE PROCESS.

Guidance #9: Because of analysis of individual key issues will occur over time, there may be relationships between the preliminary decisions that could result in adverse impacts. Prior to the issuance of a draft proposal a review should be conducted and any such impacts be analyzed.

9) Total Proposal Evaluation

If there is a preferred alternative (draft proposal) or alternative packages, describe any additional impacts and mitigation (over and above those addressed in key issue analysis) when considering the total proposal.

10) Consistency of the proposal with other plans, policies and laws.

a) Internal consistency

- (1) Is the proposal internally consistent with your agency's previously adopted or ongoing plans and regulations?
- (2) If there are internal inconsistencies, how does the proposal deal with them? Identify any strategies or ideas for resolving inconsistencies with existing, and /or, anticipated future laws, rules, or plans.

b) External consistency

- (1) Is the proposal consistent with adopted or ongoing plans and regulations of adjacent jurisdictions and/or other agencies, if applicable?
- (2) If there are external inconsistencies, how does the proposal deal with them? Identify any strategies or ideas for resolving inconsistencies with existing, and /or, anticipated future laws, rules, or plans.

11) Unavoidable impacts and impacts to be addressed later.

- a) Identify what impacts have been left to be addressed at the project level (i.e., thresholds which trigger further environmental analysis at the project level).
- b) For GMA actions, what impacts from the proposal have been designated as acceptable under chapter 36.70A RCW?

Definition: Consistency means that implementing the proposal would not result in conflicting requirements between the proposal and other applicable laws and rules you (internal) or other agencies (external) implement.

12) Monitoring and Follow-up

- a) How will the completion of and compliance with mitigation measures be monitored and enforced? Who will do the tracking, how will it be done, etc.?
- b) How will the impacts of the proposal be measured in relation to any benchmarks, performance standards and/or thresholds identified in the proposal?
- c) What other non-project actions will be necessary to achieve the objectives of this action?